Access DB# _10_

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: _Mike Butle_   Examiner # : _74655_   Date: _9/25/02_

Art Unit: _3653_   Phone Number 30 _98344_   Serial Number: _09/872481_

Mail Box and Bldg/Room Location: _5A2C_   Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.
****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: _Method of sorting & stacking storage objects_

Inventors (please provide full names): _Björn Johansson, Onsala, SE._

Earliest Priority Filing Date: _12/3/98_

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the
appropriate serial number.

See Attached

****

STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher:	NA Sequence (#)	STN
Searcher Phone #:	AA Sequence (#)	Dialog
Searcher Location:	Structure (#)	Questel/Orbit
Date Searcher Picked Up:	Bibliographic	Dr.Link
Date Completed:	Litigation	Lexis/Nexis
Searcher Prep & Review Time:	Fulltext	Sequence Systems
Clerical Prep Time:	Patent Family	WWW/Internet
Online Time:	Other	Other (specify)

PTO-1590 (8-01)

```
show files;ds
File   9:Business & Industry(R) Jul/1994-2002/Sep 26
         (c) 2002 Resp. DB Svcs.
File  20:Dialog Global Reporter 1997-2002/Sep 27
         (c) 2002 The Dialog Corp.
File 610:Business Wire 1999-2002/Sep 27
         (c) 2002 Business Wire.
File 613:PR Newswire 1999-2002/Sep 27
         (c) 2002 PR Newswire Association Inc
File 624:McGraw-Hill Publications 1985-2002/Sep 27
         (c) 2002 McGraw-Hill Co. Inc
File 634:San Jose Mercury  Jun 1985-2002/Sep 26
         (c) 2002 San Jose Mercury News
File 636:Gale Group Newsletter DB(TM) 1987-2002/Sep 27
         (c) 2002 The Gale Group
File 810:Business Wire 1986-1999/Feb 28
         (c) 1999 Business Wire
File 813:PR Newswire 1987-1999/Apr 30
         (c) 1999 PR Newswire Association Inc


Set     Items    Description
S1    3937578    STACK? OR ARRANG? OR REARRANG? OR MANIPULAT? OR MOVES OR M-
                 OVING OR MOVE
S2    5900976    CODE? OR IDENTIFIER? OR TAG OR TAGS OR NUMERICAL? OR ID OR
                 IDENTIFICATION? OR NUMBER?
S3     648985    SHUFFLE? OR SHUFFLING OR RESHUFFL? OR RESORT? OR REARRANGE
                 OR REORGANI? OR RESTACK?
S4     100882    (CHANGE? OR CHANGING OR ALTER? OR MANIPULAT?)(3N)(ORDER? OR
                 ORGANIS? OR ORGANIZ? OR ARRANG? OR STACK? OR SORT? OR SEQUEN-
                 CE)
S5     133073    PILE OR PILES OR STACK OR STACKS
S6       1494    SHEETMETAL OR METAL()SHEET?
S7         21    STACKABLE(3N)(ITEM OR ITEMS OR OBJECTS OR OBJECT)
S8      13742    (ORDER OR DATE)(3N)(NEEDED OR DESIRED OR REQUESTED)
S9     306102    LOW?(3N)HIGH?
S10   1318726    ITEM OR ITEMS OR OBJECT OR OBJECTS OR SHEETS OR PALLET?
S11   1167417    REQUEST?
S12     35459    LOW?(3N)(NUMBER? OR SEQUENCE?)
S13    105324    HIGH?(3N)(NUMBER? OR SEQUENCE?)
S14     93217    (S1 OR S2 OR S3)(3N)(S5 OR S10)
S15     33741    (S1 OR S2 OR S3)(3N)S10
S16     47947    S14 AND S2
S17        20    S6 AND S16
S18     22964    S14(5N)S2
S19         7    S18 AND S6
S20         7    RD (unique items)
S21   4836553    NUMBER?
S22     20807    S21(3N)(S1 OR S3 OR S4)
S23         1    S22(3N)S8
S24       535    S21(3N)(ORDER? OR ARRANG? OR STACK? OR REARRANGE? OR REORG-
                 ANI? OR RESTACK?)(4N)S10
S25      4164    S9(3N)S21
S26         0    S25 AND S24
S27         0    S24 AND S6
S28        21    S24 AND PALLET?
S29         2    S24 AND PALLET?/TI
S30       256    S1(5N)(BARCODE? OR BAR()CODE?)
S31         0    S30 AND (S12 OR S13)
S32        52    (BARCODE? OR BAR()CODE?)(3N)(ORDER? OR ORGANI? OR ARRANGE?
                 OR STACK?)(4N)(S10 OR SHEET)
S33        46    RD (unique items)
?
```

0/3,K/1   (Item 1 from file: 9)

02595277 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Vlasic Consolidates Pickle Production
(Vlasic Foods International has converted a 60,000-sq-ft warehouse into
  manufacturing facilities in Imlay City, MI.)
Food Engineering, v 71, n 9, p 83+
September 1999
DOCUMENT TYPE: Journal ISSN: 0193-323X   (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 837

  (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...washdown in the wet area; new sanitary ceilings in the wet area, and a
painted **sheetmetal** ceiling in the dry area. New construction totaling
about 10,000 sq.-ft, included the...

...and into the integrated tray-former/loader/packer/wrappers with built-in
ink-jet case **coders**. Cases are **palletized** automatically and stretch
wrapped.
On the six older lines, pickles are pumped from a tank...

 20/3,K/2   (Item 1 from file: 20)

23829675 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Story of a successful junkyard
 SECTION TITLE: Metro
Recah Trinidad
PHILIPPINE DAILY INQUIRER, p26
July 12, 2002
JOURNAL CODE: WDPI LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 812

  (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   the plant closed shop, what was left were all the assorted debris,
useless, rusty, contorted **metal** **sheets**, **numberless** old tires, a
gigantic iron box, sheer trash and other ugly matters that converged to...

 20/3,K/3   (Item 2 from file: 20)

18085472 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Arts: Classical - MacMillan packs a punch
PROM 8 ROYAL ALBERT HALL LONDON / RADIO 3
Keith Potter
INDEPENDENT
July 31, 2001
JOURNAL CODE: FIND   LANGUAGE: English RECORD TYPE: FULLTEXT
WORD COUNT: 434

  (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   is occasionally still to be found, and there are some splendidly
vulgar moments involving a **number** of **metal** **sheets** . Most
impressive, however, is MacMillan's unerring sense of structure and pacing,

which allows him...

15144022   (USE FORMAT 7 OR 9 FOR FULLTEXT)
Wordsmiths Inc.
STATESMAN (INDIA)
February 12, 2001
JOURNAL CODE: FSTN   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD. COUNT: 1895

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   or layout sheets, used to make press plates.
    Platemakers - produce printing plates by exposing sensitised **metal**
 sheets   to special light through a photographic negative. Some
platemakers operate machines that process the plates...

...printing and publishing industry.
    Publishing:
    Establishments engaged in publishing newspapers, periodicals, books,
and other miscellaneous **items** employ a large **number** of
professionals, particularly reporters, writers, editors, artists, and
marketing and sales occupations. These positions usually...

05989575   (USE FORMAT 7 OR 9 FOR FULLTEXT)
**SolidWorks Corporation Introduces SolidWorks 99; Innovation, Power, and
   Ease-of-Use Drive Company's Latest Release**
BUSINESS WIRE
June 30, 1999
JOURNAL CODE: WBWE   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 1433

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   the capabilities to automatically generate, organize, and customize
data within the BOM, including sorting, editing **item** **numbers**, and
splitting tables into multiple sections.
    -- The AutoCAD(R) Command Line Emulator - recognizes frequently used
...

... and drop parts from the Windows Explorer, Internet Explorer, and the
Feature Palette(TM) window.
    Sheetmetal Design
    SolidWorks offers **sheetmetal** design capabilities that allow users
to easily create designs in 3D or in the flat...
...from a flat pattern or even top, front, and side views, SolidWorks users
can view **sheetmetal** parts in 3D. With SolidWorks, users can reduce
design and production time by automatically calculating...

... 3D designs for production, and automatically dimensioning drawings.
Enhancements include:
    -- The ability to unroll conical **sheetmetal** parts.
    -- New rip-edge capabilities that allow users to easily convert boxes
and other 3D shapes into **sheetmetal** parts.
    -- Improved bend relief, multiple tabs per bend, cuts across sharp
bends, and hems.

Data...

20/3,K/6   (Item 5 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter
(c) 2002 The Dialog Corp. All rts. reserv.

02549794 (USE FORMAT 7 OR 9 FOR FULLTEXT)
KUWAIT: AIR CONDITIONING EQUIPMENT MARKET
U.S. and Foreign Commercial Service (US&FCS)
INDUSTRY SECTOR ANALYSIS
June 07, 1998
JOURNAL CODE: FISA   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 2829

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   such as compressors, motors, electrical wires and other electrical
components while its aluminum and copper **metal** **sheets** come U.S.
specifications are used extensively in Kuwait largely due to the strong
presence...

... percent "ad valorem") on almost all imports. However, the government
elevated tariffs on a limited **number** of **items** before the invasion
to protect local production.
    According to some reports, the government of Kuwait...

20/3,K/7   (Item 1 from file: 624)
DIALOG(R)File 624:McGraw-Hill Publications
(c) 2002 McGraw-Hill Co. Inc. All rts. reserv.

0434742
Cost analysis applies to broad variety of cooling towers
POWER May, 1992; Pg 95; Vol. 136, No. 5
Journal Code: POW   ISSN: 0032-5929
Section Heading: Steam generation
Word Count: 1,203   *Full text available in Formats 5, 7 and 9*

TEXT:
... made of thermoformed PVC sheets packed together. However, the shape of
corrugations, pitch between plastic **sheets**, and position and **number**
of contact points between sheets differ widely to eliminate areas favoring
the growth of biofouling...the air inlet and above the fan stacks. Noise
attenuators are aerodynamically shaped panels of **sheetmetal** skin
densely packed with mineral wool; panels are factory- or field-assembled in
an equally...
?

33/3,K/1   (Item 1 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
. (c) 2002 Resp. DB Svcs. All rts. reserv.

03340327 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Sagebrush Announces Athena 9.1 in Beta
(New version of Athena is introduced)
Computers in Libraries, v 22, n 1, p 63+
January 2002
DOCUMENT TYPE: Journal   ISSN: 1041-7915   (United States)
LANGUAGE: English   RECORD TYPE: Fulltext
WORD COUNT: 197

TEXT:
...placed on hold, booked in advance, checked out, or a fine payment is
made; renewing **items** by **bar** **code** number; printing **item**
bar **code** labels in shelf list **order**; and spell checking text
entered in the Easy Entry or MARC Entry screens and while...

33/3,K/2   (Item 2 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

03308670 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Sagebrush corp. releases athena 9.1 update in beta. (Libaray systems today)
(Athena 9.1 update announced by Sagebrush Corp)
Information Today, v 18, n 11, p 41(1)
December 2001
DOCUMENT TYPE: Journal   ISSN: 8755-6286   (United States)
LANGUAGE: English   RECORD TYPE: Fulltext
WORD COUNT: 353

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...online catalog

* Extracting patron or catalog data along with current or statistical
circulation data

* Printing **item** **bar** **code** labels in shelf list (call number)
order

* Enhanced reading program searches that can limit quick, advanced, or
visual searches to reading program...

33/3,K/3   (Item 3 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

03289292 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Recipe for success
(A profile of Sysco Corp includes sales, strategy, capacity, products, and
** technological advances)**
Warehousing Management, v 8, n 10, p 20
November 2001
DOCUMENT TYPE: Journal; Cover Story   ISSN: 1077-4068   (United States)
LANGUAGE: English   RECORD TYPE: Fulltext
WORD COUNT: 1321

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:

Karen Lehman EIC 3600 September 27, 2002

...convenience.

Additional technological advances developed by Sysco have helped to improve operational efficiencies. The Sysco **Order** Selector (SOS), a finger-mounted **bar** **code** scanner, verifies proper **item** selection. Warehouses have improved **order**-picking accuracy and decreased error rates from one in less than 1,000 to one...

33/3,K/4   (Item 4 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

03058540 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Levenger: Fulfilling More Than Slappers
(Levenger averages 5,000 order calls/day and 200,000 items in its stock; it
   operates its corporate offices, catalog, store, and a 180,000 sq ft
   distribution facility out of one location in Delray Beach, FL)
Catalog Age, v 18, n 3, p 41
March 01, 2001
DOCUMENT TYPE: Journal ISSN: 0740-3119 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 304

 (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...items are processed in the distribution center: Each station has a small computer to which **bar** **codes** are matched from **item** to **order**.

Conveyor belt length: Three belts at 50 ft. each feed into the 200-ft. main
...

33/3,K/5   (Item 5 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

02681337 (USE FORMAT 7 OR 9 FOR FULLTEXT)
WMS, bar codes, RFDC launch Borders.com
(Borders Group Inc has more than 240 retail stores and processes orders for
   these stores and for Borders.com by using a warehouse management system
   in its warehouse of almost 200,000 sq ft)
ADC News & Solutions, v 54, n 14, p 12
December 1999
DOCUMENT TYPE: Journal (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 918

 (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...to begin receipt.

As each title is removed from a case attached to that purchase **order**, its **bar** **code** is scanned. This confirms that all **items** that should have been sent actually were. For any item that arrives without a bar...

33/3,K/6   (Item 6 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

02634059 (USE FORMAT 7 OR 9 FOR FULLTEXT)

Moving more out the door
(USCO Logistics gets 650-700 small parcel shipments out the door each day
   from its 220,000 sq ft warehouse in Cerritos, CA)
ADC News & Solutions, v 54, n 12, p A-11
November 1999
DOCUMENT TYPE: Journal (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 394

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...into USCO's warehouse management system (WMS). The WMS generates a pick
list with a **bar** **coded** number on the picksheets to represent the
order **items** and shipping instructions. Order information is also
forwarded to the pack verification module, which is...

   33/3,K/7   (Item 7 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

02564474 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Identifying New Uses for Bar Coding Technology
(Only 5% of hospitals currently use bar coding technology, but use is
   expected to rise substantially over next 2 yrs; West Park Hospital
   (Canada) uses wireless medication management system from Autros
   Healthcare Solutions Inc (Canada))
Health Data Management, v 7, n 8, p 66+
August 1999
DOCUMENT TYPE: Journal ISSN: 1069-5699 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 2622

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...sheets for the patients who are scheduled for radiology exams for the
following day. Each **order** **sheet** contains a **bar** **code** located
at the upper left hand corner along with other identifying information such
as the...

...patient arrives for an appointment, the front-desk staff at the
radiology department scans the **bar** **code** on the **order** **sheet**
using a **bar** **code** reader from Intermec Technologies Corp., Cedar
Rapids, Iowa. The scan records the time of the...

   33/3,K/8   (Item 8 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

02499447 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Shop-floor data capture is plain sailing for boat manufacturer
(Marine Projects, UK boat builder, reported annual sales in the range of
   UKPd85 mil on output of about 450 boats/yr; installed enterprise resource
   planning system)
Automatic ID News Europe, v 8, n 5, p 20
June 1999
DOCUMENT TYPE: Journal ISSN: 1363-9765 (United Kingdom)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 657

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...into smaller works orders, for example, fitting the engine and moulding
the hull. The works **orders** are printed on a **barcoded** **sheet**,
which further splits the work into its various operations or tasks. For
example, one of...

33/3,K/9   (Item 9 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

02152219 (USE FORMAT 7 OR 9 FOR FULLTEXT)
H-E-B Tests Portable Self-Scanning Technology in Store
(HE Butt Grocery is testing self-scanning technology that allows customers
  to browse store aisles, scan **item **bar** **codes** and total their**
  ****orders** electronically)**
Supermarket News, v 48, n 21, p 27+
May 25, 1998
DOCUMENT TYPE: Journal   ISSN: 0039-5803   (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 480

  (USE FORMAT 7 OR 9 FOR FULLTEXT)
  ...(Butt Grocery is testing self-scanning technology that allows customers
  to browse store aisles, scan **item **bar** **codes** and total their**
  ****orders** electronically)**

ABSTRACT:·
...Co is testing a self-scanning technology that allows customers to browse
store aisles, scan **item** **bar** **codes** and total their **orders**
electronically. The store testing the technology has 96 handheld scanners
and four registers designated for...

TEXT:
...Co. here is testing self-scanning technology that allows customers to
browse store aisles, scan **item** **bar** **codes** and total their
orders electronically.

The store testing the technology has 96 handheld scanners and four
registers designated for...

33/3,K/10   (Item 10 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

01636636 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Fleming Flexes Logistics
(Fleming Cos has used Efficient Consumer Response to reposition itself as a
  value-added marketing and distribution company)
Traffic World, v 247, n 3, p 54+
October 14, 1996
DOCUMENT TYPE: Journal   ISSN: 0041-073X   (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1560

  (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...the Oklahoma City warehouses have access to two mainframes to streamline
operations," McKnight said. Every **item** is **arranged** on shelves and
given a **barcode** number. By utilizing computers installed on all
forklifts, forklift operators are able to keep track...

33/3,K/11   (Item 11 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

01416942 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Defense Spending At AWG
(Associated Wholesale Grocers to help its members compete with supercenters
  by boosting customer base, more)
Supermarket News, v 46, n 9, p 1+
February 26, 1996
DOCUMENT TYPE: Journal; Cover Story ISSN: 0039-5803 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 2364

  (USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...cases being moved to pallets. Also, it prevents a selector from moving
ahead with an **order** if the **bar** **code** registers an incorrect
item in the picking process.

"Our error rate today on a 100-case order is 0...

  33/3,K/12   (Item 12 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

01072431
Daifuku Develops World's First High Speed Picking System for Plastic
  Wrapped Soft Items
(Daifuku Co.'s new picking system is first in world that can handle soft
  items at high speed)
Nikkan Kogyo Shimbun, p 14
November 10, 1994
DOCUMENT TYPE: Business Newspaper (Japan)
LANGUAGE: Japanese RECORD TYPE: Abstract

ABSTRACT:
...a surveillance sensor, a delivery conveyor, a collection conveyor, etc.
The surveillance sensor reads off **bar** **codes** attached to **items**
and separates them according to **order** content/delivery location.
Daifuku solved the problem of not marking goods through use of its...

  33/3,K/13   (Item 13 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

01067761 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Getting it there is most of the battle
(Changes in the meat distribution system are creating opportunities in meat
  company warehouses)
National Provisioner, v 208, n 11, p 64
November 1994
DOCUMENT TYPE: Journal ISSN: 0027-996X (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1194

  (USE FORMAT 7 OR 9 FOR FULLTEXT)

ABSTRACT:
...plans to install radio frequency (RF) scanners and computer terminals at
each forklift. When all **items** and locations are **barcoded**, pick
orders can be made up instantly just before the truck arrives, assuring

accurate shipments and accurate...

TEXT:
...scanners and computer terminals in each forklift, says Doug Martin, executive vice president. Because all **items** and locations will be **barcoded**, pick **orders** can be made up instantaneously just before the truck arrives, assuring accurate shipments and proper...

33/3,K/14   (Item 1 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter
(c) 2002 The Dialog Corp. All rts. reserv.

21642264 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Modesto, Calif., Grocery Distribution Company Opens New Warehouse
Jeff Jardine
KRTBN KNIGHT-RIDDER TRIBUNE BUSINESS NEWS   (MODESTO BEE - CALIFORNIA)
March 09, 2002
JOURNAL CODE: KMOB   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 626

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   to their wrists and fingers fill the orders.
    They begin with a label for each **order**, and scan the **bar** **code** for that **order**. The computer tells them which **items** need to be picked and placed into a green tote box for shipping.
    Using a...

33/3,K/15   (Item 2 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter
(c) 2002 The Dialog Corp. All rts. reserv.

19331039 (USE FORMAT 7 OR 9 FOR FULLTEXT)
**AirClic and dynetic solutions Team to Offer Wireless Tracking Services;
   Spedition Alfred Wedlich GmbH is First to Test Wireless, Customized
   ``Track and Trace'' Capabilities**
BUSINESS WIRE
October 16, 2001
JOURNAL CODE: WBWE   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 629

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   transportation   company,   is   testing   the combined   system.
Participating employees use their cell phones to scan **bar** **codes**
 from an **order** **sheet** or package upon delivery, thereby verifying
arrival and delivery time. The information is then sent...

33/3,K/16   (Item 3 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter
(c) 2002 The Dialog Corp. All rts. reserv.

18592313 (USE FORMAT 7 OR 9 FOR FULLTEXT)
CM Downton
NUMBER 29
WESTERN DAILY PRESS , WP Late City ed, p13
August 31, 2001
JOURNAL CODE: FWDP   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 188

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   A company faced with the arrival of 60 containers from China, all
needing to be **palletised**, **order** assembled, shrink-wrapped, **bar**
coded and delivered to 92 supermarket regional distribution centres
within 24 hours, can turn to Downton...

33/3,K/17   (Item 4 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter

17332718 (USE FORMAT 7 OR 9 FOR FULLTEXT)
An Industry First -- GE Supply Barcodes a New Product Càtalog
PR NEWSWIRE
June 20, 2001
JOURNAL CODE: WPRW   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 447

      ... Technologies, users simply log on to gesupply.com (manually or by
scanning the catalog cover **barcode**) and scan individual product
barcodes of **items** being **ordered** into their "shopping cart." The
portable **barcode** scanner simply connects to a PC. Then, user-desired
quantities are entered, the order is...

33/3,K/18   (Item 5 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter

16248309 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Use price tags to complement bar codes
NEW STRAITS TIMES (MALAYSIA)
April 19, 2001
JOURNAL CODE: FNST   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 122

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

     Although supermarkets do provide machines for customers to scan the
bar **codes** in **order** to know the price of the **items**, there
are not many of these around.
      Price tags should be clearly printed on the...

33/3,K/19   (Item 6 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter

13749453 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Technology's on the move - maybe
DAN WHITCOMBE
TIMES
November 13, 2000
JOURNAL CODE: FTMS   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 531

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   link to the shop so that you can do your shopping by using a
personalised **bar** **code**.' The **ordered** **items** are then packed
and waiting for you when you arrive at the store.
     John Prial...

33/3,K/20   (Item 7 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter

09844133 (USE FORMAT 7 OR 9 FOR FULLTEXT)
PSC Introduces Its Grocer-eScan Internet Home Shopping Appliance; New PSC Momentum Bar Code Scanner Module Combines With Handspring Visor for E-Commerce Solution
BUSINESS WIRE
March 01, 2000
JOURNAL CODE: WBWE   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 1016

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   shop at home."
     Shoppers ordering with the Grocer-eScan(TM) need only point at the **bar** **code** on the **item** they wish to **order**, press the button to scan and the item is automatically added to their shopping list...

   33/3,K/21   (Item 8 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

09610940 (USE FORMAT 7 OR 9 FOR FULLTEXT)
FlashPoint and Epson To Deliver Next Generation Photo Printer Based on Digita Software Platform; Intelligent Photo Printer PT-110 Allows Direct Camera Printing without the Need for a PC
BUSINESS WIRE
February 17, 2000
JOURNAL CODE: WBWE   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 429

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   ID (eight different sizes on one sheet), album print (up to 20 images on one **sheet** with choice of printing **order**), and ScanTalk audio **barcode**-like printing.
     The printer supports 44 preprogrammed, packaged filters. There are more than 100 additional...

   33/3,K/22   (Item 9 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

07838400 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Technique - Palm offers handy devices.
COMPUTING, p52
October 21, 1999
JOURNAL CODE: WCOM   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 1107

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   a travelling salesman could, as well as using the other facilities of the Palm, scan **barcodes** from a catalogue to enter **order** **items**.
     The SPT 1700, in addition to a built-in SE 900 barcode scanning engine, has...

   33/3,K/23   (Item 10 from file: 20)
DIALOG(R)File 20:Dialog Global Reporter

04872853   (USE FORMAT 7 OR 9 FOR FULLTEXT)
SHOW ·DRAWS RECORD ATTENDANCE
Melanie Sergeant-Haape
BUSINESS DAY (SOUTH AFRICA), p23
March 25, 1999
JOURNAL CODE: FBUD   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 402

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   PCs) was its microwave oven complete with its television/computer
screen   door.   An in-built **barcode** scanner for grocery **items** allows
quick online grocery **ordering** for busy housewives.
     Loewe New Media also reckons the internet is running on the wrong...

 33/3,K/24   (Item 11 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter
(c) 2002 The Dialog Corp. All rts. reserv.

02877036   (USE FORMAT 7 OR 9 FOR FULLTEXT)
Chemical solution
PACKAGING MAGAZINE, p31
September 10, 1998
JOURNAL CODE: FPGW   LANGUAGE: English   RECORD TYPE: FULLTEXT
WORD COUNT: 392

   (USE FORMAT 7 OR 9 FOR FULLTEXT)

...   the   label on the carton corresponds to that of the sack. Finally,
the cartons are **stacked** on a **barcoded** **pallet**.
     Enquiry fax back: 54

 33/3,K/25   (Item 1 from file: 624)
DIALOG(R)File 624:McGraw-Hill Publications
(c) 2002 McGraw-Hill Co. Inc. All rts. reserv.

0462724
DON'T CALL IN THOSE ORDERS,'SCAN' THEM IN
Business Week   March 15, 1993; Pg 98G; Number 3309
Journal Code: BW   ISSN: 0007-7135
Section Heading: Information Processing
Word Count: 145   *Full text available in Formats 5, 7 and 9*

BYLINE:
EDITED BY JOHN W. VERITY

TEXT:
... a   simple way around the complexity. It has devised a handheld computer
that   scans in **bar** **codes** off a preprinted **sheet**. Codes can
represent **items** from an **order** form and prices, as well as letters,
numbers, and simple commands. Once an order is...

 33/3,K/26   (Item 2 from file: 624)
DIALOG(R)File 624:McGraw-Hill Publications
(c) 2002 McGraw-Hill Co. Inc. All rts. reserv.

0349328
**A PENNSYLVANIA YANKEE   IN LAURA ASHLEY'S COURT: How CEO James Maxmin is
    streamlining the fashion company**
Business Week   December 23, 1991; Pg 80; Number 3245
Journal Code: BW   ISSN: 0007-7135
Section Heading: People

Word Count: 1,106   *Full text available in Formats 5, 7 and 9*

BYLINE:
Richard A. Melcher in London, with Karen Lowry Miller in Japan

TEXT:
... and black velvet dresses. Maxmin tells her that, for the first time,
Ashley is installing **bar** **codes** that track inventory and will let
her **order** **items** from other shops. He adds that only now are
consumers being surveyed about what Ashley...

  33/3,K/27   (Item 1 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

03702680   Supplier Number: 47991596 (USE FORMAT 7 FOR FULLTEXT)
Hospital Giant Columbia/HCA Joins The UPN Trend
Health Data Network News, pN/A
Sept 20, 1997
Language: English   Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 226

...   a unique number that identifies a product and its manufacturer. It
generally consists of a **bar** **code** or magnetic stripe on an **item**.
     Health care **organizations** are lobbying for UPNs because they can
improve the efficiency of using electronic data interchange...

  33/3,K/28   (Item 2 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

03640287   Supplier Number: 47839030 (USE FORMAT 7 FOR FULLTEXT)
Portland Hospital Saves Time With Global Materials Management
Information Management Week, v4, n24, pN/A
July 16, 1997
Language: English   Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 377

   (USE FORMAT 7 FOR FULLTEXT)
TEXT:
...Inc., which allows the department to assign identification codes to each
stock and non-stock **item**, automate tracking of the **items** through
bar **codes** and automate such tasks as **order** generation. One of
its best features is its ability to combine stock and non-stock...

  33/3,K/29   (Item 3 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

02146208   Supplier Number: 44012942 (USE FORMAT 7 FOR FULLTEXT)
AT HOME
CardFAX, pN/A
August 2, 1993
Language: English   Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 76

   (USE FORMAT 7 FOR FULLTEXT)
TEXT:
...a DES-encrypted magnetic stripe reader and bar code reader. ScanPhone is

                   Karen Lehman EIC 3600 September 27, 2002

manufactured by US **Order**. Cardholders place **orders** by scanning the
bar **code** next to **items** selected from a catalog, swiping the
card and entering their PIN.

   33/3,K/30   (Item 4 from file: 636)

02118131   Supplier Number: 43937591   (USE FORMAT 7 FOR FULLTEXT)
NEW & EVOLVING MARKETS:Online Services To Connect with Home Shopping
Industries In Transition, v21, n3, pN/A
July, 1993
Language: English   Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 887

...   scanners and credit card slot. It plugs into a phone jack and
allows consumers to **order** **items** from **bar** **coded** catalogs,
pay bills or buy groceries without ever talking to an order taker. ScanFone
has...

   33/3,K/31   (Item 5 from file: 636)

02082075   Supplier Number: 43832445   (USE FORMAT 7 FOR FULLTEXT)
U.S. Order Assembles A ScanFone Dream Team
Bank Network News, v11, n24, pN/A
May 11, 1993
Language: English   Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 1102

   (USE FORMAT 7 FOR FULLTEXT)
TEXT:
...delivered. Ordering from catalogs also involves use of the bar code
reader. Each catalog has **bar** **codes** next to the **items** shown.
Consumers **order** by waving the **bar** **code** reader next to the
item they want. Bill payment is conducted in a similar manner.
Companies to which consumers regularly...

   33/3,K/32   (Item 6 from file: 636)

02030828   Supplier Number: 43684116   (USE FORMAT 7 FOR FULLTEXT)
RTC FINISHES THEIR BIGGEST IMAGING INSTALLATION TO DATE
Data Channels, v20, n5, pN/A
March 1, 1993
Language: English   Record Type: Fulltext
Document Type: Magazine/Journal; Newsletter; Trade
Word Count: 1285

...   Jan. 17 in a leased space near the Kansas City airport. PPSI had
prepared and **organized** the records for scanning and inserted **bar**
code **sheets** that were used to facilitate indexing. Using eight
scanners and 12 hour a day shifts...

   33/3,K/33   (Item 7 from file: 636)

                    Karen Lehman EIC 3600 September 27, 2002

01993374   Supplier Number: 43577533 (USE FORMAT 7 FOR FULLTEXT)
BELL ATLANTIC UNVEILS 'SCANFONE' HOME-SHOPPING SERVICE
Telephone Week, v10, n2, pN/A
Jan 11, 1993
Language: English   Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 798

...   are delivered.
    Grocery shopping uses a special Safeway Express catalog listing more
than 6,500 **items** with their respective **bar** **codes**. **Orders**
may be placed 24 hours a day, 7 days a week, for delivery Monday through...

  33/3,K/34   **(Item 8 from file: 636)**
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

01985749   Supplier Number: 43557286 (USE FORMAT 7 FOR FULLTEXT)
BELL ATLANTIC UNVEILS HOME-SHOPPING
Enhanced Services Outlook, v6, n1, pN/A
Jan, 1993
Language: English   Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 812

...   are delivered.
    Grocery shopping uses a special Safeway Express catalog listing more
than 6,500 **items** with their respective **bar** **codes**. **Orders**
may be placed 24 hours a day, 7 days a week, for delivery Monday through...

  33/3,K/35   **(Item 9 from file: 636)**
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

01821608   Supplier Number: 43087751 (USE FORMAT 7 FOR FULLTEXT)
Scanfone Enters Memphis, with Piggly Wiggly 06/19/92
Newsbytes, pN/A
June 19, 1992
Language: English   Record Type: Fulltext
Document Type: Newswire; General Trade
Word Count: 232

...   the system, and select the items and quantities to be purchased by
scanning their respective **bar** **codes**. After each selection,
verification of the **item** **ordered** is displayed on the ScanFone
screen. When the order is complete, customers receive an estimate...

  33/3,K/36   **(Item 10 from file: 636)**
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

01734976   Supplier Number: 42839529 (USE FORMAT 7 FOR FULLTEXT)
SMART STORE USES EFT TO BRING CONSUMERS INTO YEAR 2000
EFT Report, v15, n6, pN/A
March 18, 1992
Language: English   Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 522

...   device like the one US Order recently rolled out in San Francisco,
where consumers scan **barcodes** of **items** from a list and **order**

                    Karen Lehman EIC 3600 September 27, 2002

groceries by telephone or in the store itself.
 ·The in-store system might consist of...

   33/3,K/37   (Item 11 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

01597887   Supplier Number: 42412756 (USE FORMAT 7 FOR FULLTEXT)
ELECTRONIC MARKETING Bringing the Point-of-Sale Home -- Literally
Electronic Services Update, pN/A
Oct 1, 1991
Language: English   Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1277

...   customer uses the terminal to scan special catalogs (or supplements
to conventional catalogs) wherein each **item** is assigned a unique
bar **code**. (The **bar** **codes** are U.S. **Order**'s own, and do
not correspond to UPC or other codes which may appear on...

   33/3,K/38   (Item 12 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2002 The Gale Group. All rts. reserv.

01263096   Supplier Number: 41357996 (USE FORMAT 7 FOR FULLTEXT)
ViewStar Offers Wide Area Network Connections
Optical Information Systems Update, v9, n7, pN/A
June, 1990
Language: English   Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 331

...   of scanners as well as electronic importation of documents from
other sources. Documents can be **organized** in batches that contain
barcode cover **sheets** and document separator pages that are
interpreted by the system. The barcodes define physical handling...

   33/3,K/39   (Item 1 from file: 810)
DIALOG(R)File 810:Business Wire
(c) 1999 Business Wire . All rts. reserv.

0495305   BW0240

**STATE OF THE ART: State Of The Art announces the most comprehensive upgrade
    in the history of M.A.S 90 EVOLUTION/2 product line - M.A.S 90 Level
    2.0; M.A.S 90 Level 2.0 includes new module, significant enhancements
    to eight modules and updates to 15 modules**

June 19, 1995

Byline: Business Editors and Computer Writers

    ...Entry and
Invoice Data Entry.
o Bar Codes. New fields have now been added allowing **Order** Numbers,
Customer Numbers, **Item** Numbers, Quantities, and more to be printed
as **bar** **codes** on Sales **Orders**, Picking **Sheets**, and Invoices.
o Extended Item Descriptions may be entered for Miscellaneous Items
and Special Items...

   33/3,K/40   (Item 2 from file: 810)

0495299   BW0234

STATE OF THE ART: New material requirements planning module completes State
    Of The Art's M.A.S 90 Level 2.0 Manufacturing Solution; New Level 2.0
    enhancements   further   expand   M.A.S   90 Manufacturing Solution's
    capability and flexibility

June 19, 1995

Byline: Business Editors/High-Tech Writers

    ...Entry
    and Invoice Data Entry.
o   Bar Codes. New fields have now been added allowing **Order**
    Numbers, Customer Numbers, **Item** Numbers, Quantities, and more to b
e
    printed as **bar** **codes** on Sales **Orders**, Picking **Sheets**
, and Invoices.
o   Extended Item Descriptions may be entered for Miscellaneous
    Items and Special Items...

 33/3,K/41   **(Item 3 from file: 810)**

0341733   BW656

PENNANT: Pennant Systems introduces high-volume printer with improved print
    quality

June 25, 1993

Byline: Business Editors

    ...primary paper
drawer and a 1,000-sheet secondary drawer; and has a 2,500-**sheet** offset

stacker for output.
    o Ability to print **bar**-**code** and optical character recognition
(OCR) data.
    The IBM 3829 Advanced Function Printer will be available...

 33/3,K/42   **(Item 4 from file: 810)**

0297993   BW692

WORLDCORP: WorldCorp announces introduction of US Order's ScanFone to
    Michigan Bell customers

September 24, 1992

Byline: Business Editors/Telecommunication Writers

    ...itemization of each bill payment.
    Mike Czajka, Kroger senior advertising assistant, said ScanFone
shoppers can **order** groceries electronically from a Kroger Shoppers
Express **bar**-**coded** catalog with more than 6,500 **items**. **Orders
** are

                   Karen Lehman EIC 3600 September 27, 2002

packed by a professional Kroger shopper, and ScanFone subscribers can
.elect to have groceries...

   33/3,K/43   (Item 1 from file: 813)
DIALOG(R)File 813:PR Newswire

0551724   DC012
BELL ATLANTIC INTRODUCES HOME MANAGEMENT SERVICES IN WASHINGTON AREA

DATE: January 6, 1993   11:54 EST   WORD COUNT: 726

...in selected areas through Safeway
Express. A delivery fee of $9.95 applies to each **order**.

   When paying bills, customers use a **bar** **code** **sheet** created
especially for them that lists their regular monthly bills. They
scan a bar code...

   33/3,K/44   (Item 2 from file: 813)
DIALOG(R)File 813:PR Newswire

0521524   DE003
SCANFONE TRIAL OFFERS SHOPPING AND BILL PAYING FROM HOME

DATE: September 24, 1992   10:03 EDT   WORD COUNT: 914

...itemization of each bill payment.

   Mike Czajka, Kroger senior advertising assistant, said ScanFone
shoppers can **order** groceries electronically from a Kroger Shoppers
Express   **bar**-**coded**   catalog with more than 6,500 **items**.
Orders are packed
by a professional Kroger shopper, and ScanFone subscribers can elect to
have groceries...

   33/3,K/45   (Item 3 from file: 813)
DIALOG(R)File 813:PR Newswire

0488362   NY003
**SCANFONE   NOW AVAILABLE IN THE MEMPHIS AREA; TIME-SAVING NEW SERVICE OFFERS
    AT-HOME GROCERY SHOPPING, BILL PAYMENT, AND CATALOG ORDERING**

DATE: June 17, 1992   09:01 EDT   WORD COUNT: 1,107

...the system, and select the items and quantities to be
purchased by scanning their respective **bar** **codes** . After each
selection,
verification of the **item** **ordered** is displayed on the ScanFone LED
screen. When the order is complete, customers receive an...

   33/3,K/46   (Item 4 from file: 813)
DIALOG(R)File 813:PR Newswire

0473409   NE007
**SYMBOL   TECHNOLOGIES AND COMPUTER ASSOCIATES ANNOUNCE STRATEGIC ALLIANCE TO
    DEVELOP BAR CODE-BASED SOLUTIONS FOR CA SOFTWARE**

                    Karen Lehman EIC 3600 September 27, 2002

...the
top selling desktop accounting software in North America, can
eliminate keypunch errors on inventory **items** by using **bar** **code**
technology for **order** entry and physical inventory.

      Customers using CA-NETMAN, CA's data center administration
software for...
?

29/7/1   (Item 1 from file: 9)
DIALOG(R)File   9:Business & Industry(R)
(c) 2002 Resp. DB Svcs. All rts. reserv.

02866857   (THIS IS THE FULLTEXT)
Vehicle parts in transit
(Britax PMG launches 1,200x1,000 post **pallets** to minimize waste and
  maximize efficiency with assistance of A&G Moulding)
Packaging Week, p 22
June 29, 2000
WORD COUNT: 133

TEXT:
A&G Moulding, of Hull, has helped a manufacturer of vehicle accessories to
switch to reusable thermoplastic transit trays for its range of mirrors and
arm mounts.

Bridlington-based Britax PMG has now introduced the 1,200x1,000 post
pallets to maximise usage and minimise waste in line with the Producer
Responsibility Obligations.

The vacuum formed, high density polyethylene trays aim to accommodate the
maximum **number** of **items** in one **stackable** tray, while providing
protection and allowing for component design variations.
Director and general manager of A&G Moulding, Geoff Oliver, said: "The
packaging waste regulations mean that every company must look seriously at
reusable packaging and transport materials. Many will require only
relatively low numbers of reusable transit trays and for them bespoke
injection moulded trays will be prohibitively expensive. Vacuum formed
plastic trays will be the most affordable route."

 29/7/2   (Item 1 from file: 20)
DIALOG(R)File   20:Dialog Global Reporter
(c) 2002 The Dialog Corp. All rts. reserv.

01557997
Packagers must plan ahead for **pallet** size change
ABIX - AUSTRALASIAN BUSINESS INTELLIGENCE (PACKAGING) , p16
February 01, 1998

     Abstracted from: Packaging
     The Australian pallet is being replaced by the ISO standard pallet.
The change will be phased in over several years. The Australian Department
of Transport and Regional Development has recommended the replacement of
the Australian square pallet which measures 1168mm x 1168mm with the ISO
pallet standard which measures 1200mm x 1000mm. Asian countries and
Australia will adopt the ISO standard. Being rectangular in shape, the ISO
pallet will decrease the **number** of packs **stacked** and the
efficient use of floor space. Manufacturers will need to compare the
efficiencies of the ISO pallet with the Australian pallet

?

```
 show files;ds
   File    2:INSPEC 1969-2002/Sep W4
              (c) 2002 Institution of Electrical Engineers
   File    6:NTIS 1964-2002/Sep W5
              (c) 2002 NTIS, Intl Cpyrght All Rights Res
   File    8:Ei Compendex(R) 1970-2002/Sep W3
              (c) 2002 Engineering Info. Inc.
   File   14:Mechanical Engineering Abs 1973-2002/Sep
              (c) 2002 Cambridge Sci Abs
   File   25:Weldasearch 1966-2002/Apr
              (c) 2002 TWI Ltd
   File   31:World Surface Coatings Abs 1976-2002/Sep
              (c) 2002 Paint Research Assn.
   File   32:METADEX(R) 1966-2002/Sep B2
              (c) 2002 Cambridge Scientific Abs
   File   33:Aluminium Ind Abs 1968-2002/Sep
              (c) 2002 Cambridge Scientific Abs
   File   34:SciSearch(R) Cited Ref Sci 1990-2002/Sep W5
              (c) 2002 Inst for Sci Info
   File   35:Dissertation Abs Online 1861-2002/Aug
              (c) 2002 ProQuest Info&Learning
   File   63:Transport Res(TRIS) 1970-2002/Aug
              (c) fmt only 2002 Dialog Corp.
   File   65:Inside Conferences 1993-2002/Sep W4
              (c) 2002 BLDSC all rts. reserv.
   File   81:MIRA - Motor Industry Research 2001-2002/Sep
               (c) 2002 MIRA Ltd.
   File   87:TULSA (Petroleum Abs) 1965-2002/Oct W1
              (c)2002 The University of Tulsa
   File   94:JICST-EPlus 1985-2002/Jul W4
              (c)2002 Japan Science and Tech Corp(JST)
   File   95:TEME-Technology & Management 1989-2002/Sep W4
              (c) 2002 FIZ TECHNIK
   File   96:FLUIDEX 1972-2002/Sep
              (c) 2002 Elsevier Science Ltd.
   File   99:Wilson Appl. Sci & Tech Abs 1983-2002/Aug
              (c) 2002 The HW Wilson Co.
   File  103:Energy SciTec 1974-2002/Sep B1
              (c) 2002 Contains copyrighted material
   File  108:AEROSPACE DATABASE 1962-2002/Aug
              (c) 2002 AIAA
   File  118:ICONDA-Intl Construction 1976-2002/Sep
              (c) 2002 Fraunhofer-IRB
   File  144:Pascal 1973-2002/Sep W4
              (c) 2002 INIST/CNRS
   File  238:Abs. in New Tech & Eng. 1981-2002/Sep
              (c) 2002 Cambridge Scient. Abstr
   File  239:Mathsci 1940-2002/Nov
              (c) 2002 American Mathematical Society
   File  240:PAPERCHEM 1967-2002/Aug W3
              (c) 2002 IPST
   File  248:PIRA 1975-2002/Sep W5
              (c) 2002 Pira International
   File  293:Eng Materials Abs(R) 1986-2002/Sep
              (c) 2002 Cambridge Scientific Abs
   File  315:ChemEng & Biotec Abs 1970-2002/Aug
              (c) 2002 DECHEMA
   File  323:RAPRA Rubber & Plastics 1972-2002/Nov
               (c) 2002 RAPRA Technology Ltd
   File  335:Ceramic Abstracts 1976-2002/Q3
              (c) 2002 Cambridge Scientific Abs.
   File  434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
              (c) 1998 Inst for Sci Info

   Set     Items    Description
```

```
S1   1912427   STACK? OR ARRANG? OR REARRANG? OR MANIPULAT? OR MOVES OR M-
                OVING OR MOVE
S2   8408038    CODE? OR IDENTIFIER? OR TAG OR TAGS OR NUMERICAL? OR ID OR
                IDENTIFICATION? OR NUMBER?
S3    104206    SHUFFLE? OR SHUFFLING OR RESHUFFL? OR RESORT? OR REARRANGE
                OR REORGANI? OR RESTACK?
S4    101464    (CHANGE? OR CHANGING OR ALTER? OR MANIPULAT?)(3N)(ORDER? OR
                ORGANIS? OR ORGANIZ? OR ARRANG? OR STACK? OR SORT? OR SEQUEN-
                CE)
S5    217202    PILE OR PILES OR STACK OR STACKS
S6     11956    SHEETMETAL OR METAL()SHEET?
S7        18    STACKABLE(3N)(ITEM OR ITEMS OR OBJECTS OR OBJECT)
S8     15909    (ORDER OR DATE)(3N)(NEEDED OR DESIRED OR REQUESTED)
S9    629806    LOW?(3N)HIGH?
S10  1510843    ITEM OR ITEMS OR OBJECT OR OBJECTS OR SHEETS OR PALLET?
S11   145891    REQUEST?
S12    98836    LOW?(3N)(NUMBER? OR SEQUENCE?)
S13   142621    HIGH?(3N)(NUMBER? OR SEQUENCE?)
S14   184186    (S1 OR S2 OR S3)(3N)(S5 OR S10)
S15    72001    (S1 OR S2 OR S3)(3N)S10
S16    57235    S14 AND S2
S17       65    S6 AND S16
S18    36347    S14(5N)S2
S19       48    S18 AND S6
S20       37    RD (unique items)
S21  4076609    NUMBER?
S22    14814    S21(3N)(S1 OR S3 OR S4)
S23        1    S22(3N)S8
S24      675    S21(3N)(ORDER? OR ARRANG? OR STACK? OR REARRANGE? OR REORG-
                ANI? OR RESTACK?)(4N)S10
S25     5765    S9(3N)S21
S26        0    S25 AND S24
S27        1    S24 AND S6
S28       30    S24 AND PALLET?
?
```

```
ι S25        5765   S9(3N)S21
  S26           0   S25 AND S24
  S27           1   S24 AND S6
?s s24 and pallet?
              675   S24
            25092   PALLET?
     S28        30  S24 AND PALLET?
?t 28/7/all
```

28/7/1   (Item 1 from file: 2)

5723744   INSPEC Abstract Number: C9711-4240C-049
   Title: An approximation algorithm for stacking up bins from a conveyer onto *pallets*
   Author(s): Rethmann, J.; Wanke, E.
   Author Affiliation: Dept. of Comput. Sci., Dusseldorf Univ., Germany
   Conference Title: Algorithms and Data Structures. 5th International Workshop, WADS '97 Proceedings   p.440-9
   Editor(s): Dehne, F.; Rau-Chaplin, A.; Sack, J.-R.; Tamassia, R.
   Publisher: Springer-Verlag, Berlin, Germany
   Publication Date: 1997 Country of Publication: Germany   x+476 pp.
   ISBN: 3 540 63307 3   Material Identity Number: XX97-01899
   Conference Title: Proceedings of Workshop on Algorithms and Data Structures
   Conference Sponsor: Carleton Univ.; TUNS/Dalhousie Univ
   Conference Date: 6-8 Aug. 1997   Conference Location: Halifax, NS, Canada
   Language: English   Document Type: Conference Paper (PA)
   Treatment: Theoretical (T)
   Abstract: Given a sequence of bins $q=(b_1, ..., b_n)$ and a positive integer p. Each bin is destined for a *pallet*. The authors consider the problem to remove step by step all bins from q such that the positions of the bins removed from q are as less as possible and after each removal there are at most p open *pallets*. (A *pallet* t is called open if the first bin for t is already removed from q but the last bin for t is still contained in q. If a bin b is removed from q then all bins to the right of b are shifted one position to the left.) The maximal position of the removed bins and the maximal *number* of open *pallets* are called the storage capacity and the *number* of *stack*-up places, respectively. They introduce an $O(n.\log(p))$ time approximation algorithm that processes each sequence q with a storage capacity of at most $s_{min}/(q,p).[\log_2(p+1)]$ bins and p+1 stack-up places, where $s_{min}/(q, p)$ is the minimum storage capacity necessary to process q with p stack-up places. (8 Refs)
   Subfile: C

28/7/2   (Item 2 from file: 2)

03767119   INSPEC Abstract Number: C91001720
  Title: AI *palletizing* robot system
   Author(s): Tajima, S.; Kaida, T.; Morita, M.
   Author Affiliation: Mitsubishi Electric Corp., Tokyo, Japan
   Journal: Robot   no.75   p.33-8
   Publication Date: July 1990 Country of Publication: Japan
   CODEN: ROBBDQ ISSN: 0387-1940
   Language: Japanese   Document Type: Journal Paper (JP)
   Treatment: Practical (P); Product Review (R)
   Abstract: In the field of physical merchandise distribution, demands for the reduction of time between ordering and delivery, mechanization of

manpower and cost reduction of merchandise handling have been dramatically increasing due to the diversification of products and the growing trend toward small-lot production. To meet these demands, Mitsubishi Electric Corp. has developed the AI *palletizing* robot system, which can *stack* required *numbers* of workpieces (diversified both in size and shape) on one *pallet*. (2 Refs)
   Subfile: C

   28/7/3   (Item 3 from file: 2)

01146268   INSPEC Abstract Number: C78003028
   Title: Automated tobacco products' storing and sorting system
   Journal: Ishikawajima-Harima Engineering Review   vol.17, no.4   p. 418-25
   Publication Date: July 1977 Country of Publication: Japan
   CODEN: ISHGAV ISSN: 0578-7904
   Language: Japanese   Document Type: Journal Paper (JP)
   Treatment: Applications (A); General, Review (G)
   Abstract: Describes an automated tobacco products' storing and sorting system. Tobacco products transported in *pallets* by vans are stored in an automated warehouse; simultaneously, the required *number* of *pallets* are taken out and *arranged* for sorting for delivery and thereafter automatically stored on a standby conveyor by a depalletizer. By keying in delivery demands to the operation panel, required brands of tobacco products are automatically discharged for delivery by van. (0 Refs)
   Subfile: C

   28/7/4   (Item 1 from file: 8)

01785238   E.I. Monthly No: EI8508068436   E.I. Yearly No: EI85065669
   Title: TAPE REEL CONTAINER.
   Author: Anon
   Source: IBM Technical Disclosure Bulletin v 28 n 1 Jun 1985 p 127-128
   Publication Year: 1985
   CODEN: IBMTAA   ISSN: 0018-8689
   Language: ENGLISH
   Document Type: JA; (Journal Article)   Treatment: A; (Applications)
   Journal Announcement: 8508
   Abstract: A plastic container for ten 8-inch reels of one-half inch magnetic recording tape allows stable *stacking* of a *number* of the containers on *pallets* and the like. Since the container is made of plastic, it can be used to transport the reels to clean-room areas, such as tape test centers.

   28/7/5   (Item 2 from file: 8)

00540883   E.I. Monthly No: EI7605030033   E.I. Yearly No: EI76015859
   Title: BRAKEMOTORS MOVE CAN CONVEYORS SOFTLY.
   Author: Seneczko, Myron
   Source: Power Transmission Design v 18 n 3 Mar 1976 p 47-49
   Publication Year: 1976
   CODEN: PWTDAH   ISSN: 0032-6070
   Language: ENGLISH
   Journal Announcement: 7605
   Abstract: In a can-making plant, a *palletizer* stacks empty cans in tiers on a wooden *pallet* as they come off a can line. Typically, a

single-high *pallet* load may be 50 to 60 in. high. A chain conveyor must move the unstable load to a strapping machine. Economation, Inc. has a soft-start and -stop drive package for their chain conveyors that will do the job without dumping the cans. Economation's material handling systems for *palletized* loads comprise a *number* of different modules, *arranged* in an appropriate layout for the job at hand. Three basic modules are the chain conveyor, powered transfer car, and turntable. The three modules have a similar drive package that consists of an a. c. motor with disc brake, v-belt drive, fluid coupling, right-angle wormgear speed reducer, and a chain drive.

28/7/6   (Item 1 from file: 34)

06789055   Genuine Article#: BL01E   Number of References: 9
Title: An approximation algorithm for stacking up bins from a conveyer onto *pallets*
Author(s): Rethmann J (REPRINT) ; Wanke E
Corporate Source: UNIV DUSSELDORF,DEPT COMP SCI/D-40225
    DUSSELDORF//GERMANY/ (REPRINT)
Language: English   Document Type: ARTICLE
Abstract: Given a sequence of bins q = (b(1),...,b(n)) and a positive integer p. Each bin is destined for a *pallet*. We consider the problem to remove step by step all bins from q such that the positions of the bins removed from q are as less as possible and after each removal there are at most p open *pallets*. (A *pallet* t is called open if the first bin for t is already removed from q but the last bin for t is still contained in q. If a bin b is removed from q then all bins to the right of b are shifted one position to the left.)
     The maximal position of the removed bins and the maximal *number* of open *pallets* are called the storage capacity and the *number* of *stack*-up places, respectively. We introduce an O(n.log(p)) time approximation algorithm that processes each sequence q with a storage capacity of at most s(min)(q,p).inverted right perpendicular log(2)(p + 1) inverted left perpendicular bins and p + 1 stack-up places, where s(min)(q,p) is the minimum storage capacity necessary to process q with p stack-up places.

28/7/7   (Item 1 from file: 35)

01397099 ORDER NO: AADMM-90943
THREE-DIMENSIONAL STACKING *PALLETIZATION* OF MULTI-SIZE BOXES
   Author: ARGHAVANI, JAFAR
   Degree: M.A.SC.
   Year: 1993
   Corporate Source/Institution: CONCORDIA UNIVERSITY (CANADA) (0228)
   Adviser: G. ABDOU

     The focus of the thesis is on the 3D stacking *palletization* of multi-size boxes. Boxes of both rectangular and square dimensions are used. The *palletization* objectives are: maximization of the *pallet* utilization and stability of the stacks, minimization of the

work-in-process (WIP) area and of the *palletization* time. Previous
literature on one, two and three-dimensional cutting-stock, packing, and
pallet loading problems have been reviewed. Three models are developed to
deal with three different types of *palletization* problems. Model 1 is a
mathematical Integer Linear Programming (ILP) model which deals with 3D
pallet volumetric optimization. Model 2 provides solutions to 3D stacking
palletization, applying interactive 2D *palletization* and stacking
multi-layer procedures. The solutions to the Model 1 and Model 2 problems
are obtained using the LINDO (Linear INteractive Discrete Optimizer)
software. Model 3 is a random sequence heuristic for 3D *stacking*
palletization, where the *number* and the availability of non-identical
size boxes are unknown and their incoming is random. A program is written
in C language to obtain the solution for the latter model. Several examples
are illustrated for the three models. The practical limitations are set and
reflected in the models. The results obtained from the developed models are
compared with those from previous studies.

28/7/8   (Item 1 from file: 63)
DIALOG(R)File   63:Transport Res(TRIS)
(c) fmt only 2002 Dialog Corp. All rts. reserv.

00330060   DA
TITLE: *PALLETS*: HAVE WE REACHED THE ULTIMATE IN DEVELOPMENT AND DESIGN?
AUTHOR(S): Hardwick, J
CORPORATE SOURCE: Turrett Press Limited, 65/65 Turnmill Street, Stamford
    House, London EC1, England
JOURNAL: Storage Handling Distribution   Pag: 12p
PUBLICATION DATE: 19800800   PUBLICATION YEAR: 1980
LANGUAGE: English   SUBFILE: MRIS   (M 8106)
SOURCE ACCESSION NUMBER: ICHCA No. 3986
AVAILABILITY: International Cargo Handling Coordination Assn; Abford House,
    15 Wilton Road   ; London SW1V 1LX; England
DATA SOURCE: International Cargo Handling Coordination Assn
ABSTRACT: In the last four years no "revolutionary" developments have taken
    place in the field of *pallets*. Users are still seeking a one trip
    unit, and manufacturers finding ways of reducing production costs, but
    in many instances legislation and marketing arrangements aimed at
    better control have brought about a move to a higher grade of *pallet*.
    There are also moves to rationalize the enormous *number* of *pallet*
    designs, and bring some *order* to component sizes. The economic
    situation in recent years, coupled with other external but
    inter-related forces, has caused a widespread demand for *pallets* of a
    higher grade, and reversed the growing trend towards seeking a genuine
    expendable or one-trip *pallet*. The costs associated with this trend
    have led to higher demand for *pallet* pools, and better control of
    pallet movements. The article considers dimensions, specification and
    testing of *pallets*, and gives details of a large number of *pallet*
    manufacturers.
SUBJECT HEADING: M04FMAG,CARGO AND MATERIALS HANDLING

28/7/9   (Item 1 from file: 94)
DIALOG(R)File   94:JICST-EPlus
(c)2002 Japan Science and Tech Corp(JST). All rts. reserv.

04846484   JICST ACCESSION NUMBER: 01A0377985   FILE SEGMENT: JICST-E
Pallet Input Control for a Closed Loop Production System.
IYAMA TOSHIRO (1); MIZUNO MASAHIRO (1); TAMAKI JUN'ICHI (2); SATO EISUKE
    (3)
(1) Iwate Univ., Fac. of Eng.; (2) Kitami Inst. of Technol.; (3) Tohoku
    Electr. Power Co., Inc.
Nippon Kikai Gakkai Ronbunshu. C(Transactions of the Japan Society of
    Mechanical Engineers. C), 2001, VOL.67,NO.655, PAGE.866-872, FIG.7,
    TBL.4, REF.7

ABSTRACT: The number of *pallets* circulating in a closed loop production
    system is an important factor which affects the production rate. If the
    number is large, *pallets* stagnate in the system. If the number is
    small, an idling state occurs frequently in many stages. In both cases
    the production rate drops. Therefore, it is necessary to control the
    number of in-process *pallets* in the system according to the states of
    pallet flow and stages in order to maximize the production rate. In
    this paper, we study the effect of *pallet* input control for a closed
    loop production system with constant operation cycle time and stage
    breakdown. First, we model a *pallet* flow in the system by a Markov
    model, and analyze the maximum production rate yielded in the system
    and the optimum policy for *pallet* input control by a Markov decision
    process. Next, we present the effectiveness of *pallet* input control
    comparing with the uncontrolled system. Finally, in *order* to
    investigate the effect of the *number* of *pallets* on the production
    rate, we analyze the production rate and the number of in-process
    pallets under the optimum policy using the reward function which
    consists of the production rate and the number of in-process *pallets*.
    The main results are as follows. (1) There is the optimum policy for
    pallet input control which yields the maximum production rate. (2)
    The *pallet* control is effective to increase the production rate and
    decrease the number of in-process *pallets*. (3) The decrease of the
    number of *pallets* monotonously reduces the production rate. However,
    if the buffer capacity is large, the reduction is very small near the
    maximum production rate. (author abst.)

28/7/10   (Item 1 from file: 95)

01189923 W98046366400
**Miglioramento della permeabilita a caldo della miscela di agglomerazione
mediante interventi sulla distribuzione della densita e del calore lungo
l'altezza dello strato**
(Verbesserung der Permeabilitaet der Sintermischung waehrend des Sinterns
durch Massnahmen, die die Dichte in der Tiefe der Schuettung beeinflussen)
(Improvement in hot permeability of the sinter mix through action on the
distribution of density and through the bed depth)
Scarton, A; Pinti, M; Castoro, C
Centro Sviluppo Materiali, Roma, I

ABSTRACT:
Improve in hot permeability of sinter mix, by changes of charge density
presents one of the possible interventions to optimize sinter plant
productivity. The techniques currently used, at industrial level,
determines a not uniformity of mechanical characteristics on the product
because of different permeability zones existing. Research objective is to
set sinter mix softening systems in order to modify charge density and to
evaluate eventual addition of additives or other materials to obtain the
heating zones uniformity. A pilot plant for raw-mix charging simulation on
sinter plant has been designed and built. Additionally a new bars-supports
system to industrial tests has been designed. Many charging tests on pilot
scale, with mixture of type currently used at sinter-plants of ELP Taranto
works have been made in order to analyse the influence on the cold

characteristics (charge density distribution, granulometric segregation
along the height of the layer, cold permeability) of some parameters like
bars position respect to the bottom of *pallets*, bars *number* and their
arrangement in the layer section, bars geometry and size of their
section. Four different types of softening bars have been testes. For as
concerning bars arrangement in layer section, good results has been
obtained by using of disposed bars on two rows. It has been conduced a more
directly evaluation of the bars effects on the process characteristics like
hot permeability, sinter rate, productivity, coke consumption, quality by
means of a serious of sinter tests performed on pilot plant. Possibility to
inject, through bars, materials of opportune characteristic like steel
making scraps or blast furnace dust in the mixture layer to fill the void
left from bars and so to improve heat distribution in bars zone, during the
process, has been evaluated. Obtained results have highlighted the
insufficient consequent effect by local injection of material different
from the same mixture, in bars zone. Industrial testing has confirmed the
improvement of process yield given from bars with small size of section
(reduction of return fine by 20-30 % respect to rectangular big bars). Good
results in terms of productivity have been found by rectangular narrow bars
(+ 4 % respect to traditional bars).

28/7/11   (Item 1 from file: 103)
DIALOG(R)File 103:Energy SciTec
(c) 2002 Contains copyrighted material. All rts. reserv.

04441722   CLA-99-030623; EDB-99-022401
Title: **Improvement in hot permeability of the sinter mix through action on
      the distribution of density and through the bed depth**
Original Title: Miglioramento della permeabilita a caldo della miscela di
      agglomerazione mediante interventi sulla distribuzione della densita e
      del calore lungo d'altezza dello strato
Author(s)/Editor(s): Scarton, A.; Pinti, M.; Castoro, C.   (Centro Sviluppo
      Materiali, Roma (Italy))
Corporate Source: Commission of the European Communities (Luxembourg)
Publication Date: 1998
(61 p)
Report Number(s): EUR-16818-IT
ISBN: 92-828-2024-6
Language: Italian
Availability: Office for Official Publications of the European Communities,
      L-2985 Luxembourg
Abstract: The objective of this research is to set sinter mix softening
      systems in order to modify charge density and to evaluate eventual
      addition of additives or other materials to obtain the heating zones
      uniformity. A pilot plant for raw-mix charging simulation on sinter
      plant has been designed and built; additionally a new bar system for
      industrial tests has been designed. Charging tests were made on a pilot
      scale, with mixture currently used at sinter plants of ILP Taranto
      works (southern Italy) in order to analyse the influence on the cold
      characteristics (charge density distribution, granulometric segregation
      along the height of the layer, cold permeability) of some parameters
      such as: bars position with respect to the bottom of *pallets*, bars
      number and their *arrangement* in the layer section, bars geometry
      and size of their section. A more direct evaluation of the bars effects
      on the process characteristics (hot permeability, sinter rate,
      productivity, coke consumption, quality etc.) has been made by means of
      a series of sinter tests performed in pilot plant.

28/7/12   (Item 1 from file: 144)
DIALOG(R)File 144:Pascal
(c) 2002 INIST/CNRS. All rts. reserv.

13211544   PASCAL No.: 97-0478289

An approximation algorithm for stacking up bins from a conveyer onto
pallets
Algorithms and data structures : Halifax NS, August 6-8, 1997
RETHMANN J; WANKE E
DEHNE Frank, ed; RAU-CHAPLIN Andrew, ed; SACK Joerg-Rudiger, ed; TAMASSIA
Roberto, ed
University of Duesseldorf, Department of Computer Science, 40225
Duesseldorf, Germany
WADS'97 : workshop on algorithms and data structures (Halifax NS CAN)
1997-08-06
Journal: Lecture notes in computer science, 1997, 1272 440-449
ISBN: 3-540-63307-3 ISSN: 0302-9743 Availability: INIST-16343;
354000061707250390
No. of Refs.: 8 ref.
Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)
Country of Publication: Germany; United States
Language: English

Given a sequence of bins q = (b SUB 1 ,...,b SUB n) and a positive
integer p. Each bin is destined for a *pallet*. We consider the problem to
remove step by step all bins from q such that the positions of the bins
removed from q are as less as possible and after each removal there are at
most p open *pallets*. (A *pallet* t is called open if the first bin for t
is already removed from q but the last bin for t is still contained in q.
If a bin b is removed from q then all bins to the right of b are shifted
one position to the left.) The maximal position of the removed bins and the
maximal *number* of open *pallets* are called the storage capacity and the
number of *stack*-up places, respectively. We introduce an O(n. log(p))
time approximation algorithm that processes each sequence q with a storage
capacity of at most s SUB m SUB i SUB n (q,p). (log SUB 2 (p + 1)) bins and
p + 1 stack-up places, where s SUB m SUB i SUB n (q,p) is the minimum
storage capacity necessary to process q with p stack-up places.

   28/7/13   (Item 1 from file: 240)

00589169   PAPERCHEM NO: PB0201995
   Assembly of Packaged Reams and Method Therefor
   Villemure, A.
   PATENT ASSIGNEES: Domtar
   PATENT NUMBER: US 5647191 PATENT DATE: 970715 PATENT CLASS#: 53/447
PATENT APP# - DATE OF APPLICATION
   US 576786 - 951221
   SOURCE: U.S. pat. 5,647,191. Issued July 15, 1997. 16 claims. 8 p.
Cl.53/447. Filed: U.S. appln. 576,786} (December 21, 1995). [Engl.]
   PUBLICATION YEAR: 1997
   DOCUMENT TYPE: PATENT
   LANGUAGES: ENGLISH
   A *number* of wrapped reams of paper *sheets* are *stacked* on a *pallet*
 (e.g., a paperboard *pallet*) with films of adhesive between the wrapped
packages to hold the stack together. Vertical corner posts are applied to
the assembly and it is wrapped in a protective covering for shipment. On
the display floor, the covering is removed and a sleeve is placed over the
stack of reams to prevent the stack from being inadvertently disrupted. The
sleeve has a removable panel that provides access to the wrapped packages.

   28/7/14   (Item 2 from file: 240)

00287183   PAPERCHEM NO: AB6110052

               Karen Lehman EIC 3600 September 27, 2002

Shipping, Storage, and Handling Arrangement for Sheet and Continuous Business Forms

Selack, D. A.; Smith, R. J.; Weeks, R. R.
PATENT ASSIGNEES: Standard Register Co. (Dayton: OH: United States)
PATENT NUMBER: US 4834242 PATENT DATE: 890530 PATENT CLASS#: 206/555
PATENT APP# - DATE OF APPLICATION
US 153991 - 880209
SOURCE: U.S. pat. 4,834,242. May 30, 1989. 20 claims. 8 p. Cl.206/555.
Filed: U.S. appln. 153,991 (Feb. 9, 1988).
PUBLICATION YEAR: 1989
DOCUMENT TYPE: PATENT
LANGUAGES: ENGLISH
A shipping package of paper sheets includes a *pallet*, a bottom cap member positioned on the *pallet*, and a *number* of *stacks* of the paper *sheets* positioned on the bottom cap. Each of the stacks has a cover and a bottom tray. Each stack tray has vertical lines of weakening defining a section that can be torn out of one wall of the tray, so as to expose all the sheets in the stack and facilitate their removal from the tray. A shim in the bottom of the tray helps in grasping the sheets for removal. A top cap is positioned over the top of the stacks, and a layer of plastic film covers the assembly. The trays and covers are made of pbd., as are the caps.

28/7/15   (Item 3 from file: 240)
DIALOG(R)File 240:PAPERCHEM
(c) 2002 IPST. All rts. reserv.

00171092   PAPERCHEM NO: AB5210341
CORNERBOARD FOR *PALLETS*
Cox, C. E
PATENT NUMBER: US 4292901 PATENT DATE: 811006 PATENT CLASS#: 108/55.1
PATENT APP# - DATE OF APPLICATION
US 63949 - 790806
US 907096 - 780518
SOURCE: U.S. pat. 4,292,901. Issued Oct. 6, 1981. 6 claims. 5 p. Cl.108/55.1. Filed: U.S. appln. 63,949 (Aug. 6, 1979). Priority: U.S. appln. 907,096 (May 18, 1978).
PUBLICATION YEAR: 1981
DOCUMENT TYPE: PATENT
LANGUAGES: ENGLISH
In forming a unit load comprising a *number* of cartons *stacked* on a *pallet* , the load is unitized by means of vertical angle rods placed at the corners of the stack, together with tie means running around the stack to hold the angle rods in place. The angle rods may be made of plastic or metal, and may include different interlocked sections and spacers chosen so as to fit different load sizes.

28/7/16   (Item 4 from file: 240)
DIALOG(R)File 240:PAPERCHEM
(c) 2002 IPST. All rts. reserv.

00160473   PAPERCHEM NO: AB5111392
STACKED SHIPPING UNIT
Brown, P. H.; Inland Container Corp
PATENT NUMBER: US 4244472 PATENT DATE: 810113 PATENT CLASS#: 206/597
PATENT APP# - DATE OF APPLICATION
US 45753 - 790605
SOURCE: U.S. pat. 4,244,472. Issued Jan. 13, 1981. 5 claims. 5 p. Cl.206/597. Filed: U.S. appln. 45,753 (June 5, 1979).
PUBLICATION YEAR: 1981
DOCUMENT TYPE: PATENT
LANGUAGES: ENGLISH
A shipping unit comprises a *number* of trays *stacked* in tiers on a

pallet and retained on the *pallet* by means of strapping or shrink-wrapping. Each tray has integral tabs which project down below the tray bottom in the plane of each side wall. It is intended that the trays should be used for packaging articles of rectangular parallelepipedal shape, such as battery cases, and of a height somewhat greater than the height of the side walls of the trays. Thus when the filled trays are stacked, the group of downwardly depending tabs of each tray telescopes over the tops of the packaged articles in the next lower tray to help stabilize the assembly. Each tray is made from a single blank of corrugated pbd., with interlocked corner constructions.

28/7/17   (Item 5 from file: 240)
DIALOG(R)File 240:PAPERCHEM

00125620   PAPERCHEM NO: AB4809679
IMPROVEMENTS IN PACKAGE ASSEMBLIES COMPRISING WRAP-AROUND CONTAINERS
  Mead Corp
  PATENT NUMBER: GB 1492587 PATENT DATE: 771123
PATENT APP# - DATE OF APPLICATION
  GB 7449238 - 741114
  DE 2356748 - 731114
  SOURCE: Brit. pat. 1,492,587. Issued Nov. 23, 1977. 6 claims. 7 p. Filed: Brit. appln. 49238/74 (Nov. 14, 1974). Priority: Ger. 2,356,748 (Nov. 14, 1973).
  PUBLICATION YEAR: 1977
  DOCUMENT TYPE: PATENT
  LANGUAGES: ENGLISH
  A package assembly comprises a *pallet* board on which are *arranged* a *number* of wrap-around six-pack-style bottle or can packs formed with wrap-around cartons. The *pallet* board has a number of upright posts which engage the cartons through apertures in the carton bottoms, thereby stabilizing the package assembly.

28/7/18   (Item 1 from file: 248)
DIALOG(R)File 248:PIRA

00598884   Pira Acc. Num.: 20195920
  Title: *Palletizers*: man vs machine
  Authors: Maloney D
  Source: Mod. Mater. Handl. vol. 56, no. 7, June 2001, pp 65, 67, 69
  ISSN: 0026-8038
  Publication Year: 2001
  Document Type: Journal Article
  Language: English
  Pira Subfiles: Packaging (PK)
  Journal Announcement: 0110
  Abstract: Automated *palletising* systems have a *number* of benefits over manual *stacking* systems, including higher throughputs, fewer injuries, more consistent stacking, and improved accuracy. The two primary types of *palletising* system are in-line and robotic. In-line *palletisers* include row stripper *palletisers* and vacuum head systems. Robotic *palletisers* include selective compliant articulated robot arm (SCARA), and articulated arm systems. Five steps to consider before installing a system are: define the load, determine throughput rates, compare actual expenditure against hard and soft costs, establish a budget, and select the system.

28/7/19   (Item 2 from file: 248)
DIALOG(R)File 248:PIRA

00592730   Pira Acc. Num.: 20190495
 Title: Corrugated paper: the way of waste reduction is planning more
  Authors: Mercante Savastano R; Capo P
  Source: Papel vol. 61, no. 12, Dec. 2000, pp 58-59 (C, K, S)
  Publication Year: 2000
  Document Type: Journal Article
  Language: Portuguese
  Pira Subfiles: Paperbase (PB)
  Journal Announcement: 0107

Abstract: In order to minimise losses, it is necessary to combine all the attributes needed to a good packaging logistics using corrugated board boxes, from first level packaging to haulage and storage. In order to do that it is necessary not only to take into account factors such as maximum *stacking* *number*, *palletising* and the environmental conditions in all stages, but also to make the best use of design. The resulting improvements not only reduce waste but also add value to the entire system of corrugated board packaging.

28/7/20   **(Item 3 from file: 248)**
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00556251   Pira Acc. Num.: 20156477
 Title: E-conveyors
  Authors: Maloney D
  Source: Mod. Mater. Handl. vol. 55, no. 1, Jan. 2000, pp 49, 51, 53, 55
  ISSN: 0026-8038
  Publication Year: 2000
  Document Type: Journal Article
  Language: English
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 0004

Abstract: The requirements of materials handling systems, suitable for the rapidly expanding electronic commerce distribution centres, together with examples of conveyor and sorting systems used by 3 e-commerce companies are discussed. The need for fast flexible systems able to handle small sized *items*, small *numbers* of *items*, but large *numbers* of *orders* , are outlined. Options for new facilities, include retrofitting existing centres and contract packaging, are also mentioned. The benefits of belt, roller, slider bed and accumulating conveyors and modular conveyors, together with those of popup wheel, popup belt, right angle transfers, push diverters and sliding shoe sorters, are considered. Systems used by Toysrus.com, a traditional retail business, using electronic commerce system, Amazon.com and Priority Fulfillment Services, a leading third party provider, are outlined.

28/7/21   **(Item 4 from file: 248)**
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00457623   Pira Acc. Num.: 20061133
 Title: Focus on *palletising* and depalletising
  Authors: Anon
  Source: Int. Bottler Packer vol. 70, no. 5, May 1996, pp 38, 40-42, 44-48, 50-52, 54
  ISSN: 0020-6199
  Publication Year: 1996
  Document Type: Journal Article
  Language: English
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 9611
  Abstract: A mix of *palletisers* and depalletisers exhibited at the 1996

- Interpack Exhibition in Dusseldorf is reviewed. A new medium to high speed system produced in a joint venture between British and Canadian companies will be distributed throughout Europe. A low cost semiautomatic single column *palletiser* can be converted to a fully automatic operation when required. Inbuilt computer technology is used in a new *palletising* robot capable of any *number* of *stacking* pattern possibilities. A patented system, with two synchronised layer loading platforms, reduces cycle times for maximum output levels. A multiformat *palletiser* offers maximum flexibility working with *pallets* of different dimensions. The stability of contoured polyethylene terephthalate soft drink bottles is improved during depalletising with a new special four sided containment device. (16 fig)

28/7/22   (Item 5 from file: 248)
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00356606   Pira Acc. Num.: 10232073   Pira Abstract Numbers: 03-93-03165
 Title: LABEL MEETS EUROPEAN STANDARDS
  Authors: Anon
  Source: Manuf. Chem. vol. 64, no. 4, Apr. 1993, p. 51
  ISSN: 0262-4230
  Publication Year: 1993
  Document Type: Journal Article
  Language: English
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 9308
  Abstract: Samuel Jones has introduced a new range of self-adhesive laminates which are designed to meet European standards for *pallet* labels. The advanced bar coding on the labels meet specifications set by the European Pressure-Sensitive Manuf. Assoc. The labels have three bar codes: a product code using EAN-13 standard; and a customer's *order* *number* and *pallet* serial *number* , both using EAN-128 symbols. The labels are imaged on a laser printer using Taktik self-adhesive labels and are applied to *pallets* of Taktik and Super Flat-Sam roll label products. The new labels will improve automatic booking-in of stock. (Short article)

28/7/23   (Item 6 from file: 248)
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00354260   Pira Acc. Num.: 10289544   Pira Abstract Numbers: 08-93-PT02530
 Title: FIRST TO THE BAR
  Authors: Anon
  Source: Screen Process vol. 43, no. 3, Mar. 1993, p. 4
  ISSN: 0953-3338
  Publication Year: 1993
  Document Type: Journal Article
  Language: English
  Pira Subfiles: Printing and Publishing (PP); Printing Abstracts (PT)
  Journal Announcement: 9307
  Abstract: A new label incorporating three bar codes is applied to all *pallets* of Taktik and Super Flat-Sam roll-label products, for roll-label printers. The bar codes are product code, using EAN-13 standard, customer *order* *number*, and *pallet* serial *number*. Samuel Jones has updated in-house software running on an IBM AS 400 computer to meet EPSMA bar coding principles for *pallet* labels. They are imaged by a laser printer, using Taktik self-adhesive laser labels. (Short article)

28/7/24   (Item 7 from file: 248)
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00353566   Pira Acc. Num.: 10262056   Pira Abstract Numbers: 03-93-02724
 Title: ADVANCED BAR CODING FOR *PALLET* LABELS
  Authors: Anon
  Source: Labels Labelling vol. 15, no. 2, Mar.-Apr. 1993, p. 18
  ISSN: 0143-2192
  Publication Year: 1993
  Document Type: Journal Article
  Language: English
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 9307
  Abstract: A *pallet* label featuring bar coding according to the
standards set down by the European Pressure-Sensitive Manuf Assoc has been
developed by Samuel Jones. Incorporating product code, customer's *order*
number and *pallet* serial *number*, the label can improve stock control
by enabling automatic booking-in. An IBM AS 400 computer running updated
in-house software is being used, along with a laser printer. (Short
article)

  28/7/25   (Item 8 from file: 248)
 DIALOG(R)File 248:PIRA
 (c) 2002 Pira International. All rts. reserv.

 00343484   Pira Acc. Num.: 10230826   Pira Abstract Numbers: 03-93-01577
  Title: MARKET SURVEY HIGHLIGHTS ROBOT POTENTIAL WITHIN BOTTLING INDUSTRY
  Authors: Wilson M
  Source: Oil Packer vol. 5, no. 2, Nov. 1992-Jan. 1993, pp 18-19
  Publication Year: 1992
  Document Type: Journal Article
  Language: English
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 9304
  Abstract: Previously considered only useful with high volume output, this
report looks at the ways in which robots are now beginning to become a
useful tool within the UK bottling industry. A survey carried out by Fanuc
Robotics UK Ltd, aimed at identifying problematic areas which could be
overcome by robots. Industrial robots are widely used within the automotive
industry, but now the flexibility of robots has lead Fanuc to develop
specialised *palletising* robots. Damage in transit is reduced with
stacking patterns interlocking boxes together. A *number* of different
pallets may be *palletised* simultaneously by robot and such systems will
work out the stacking pattern when different sized boxes reach the
palletising robot at random. Feeding raw material into the line is also
another useful area. As new products are developed, the need for more
flexibility is required and new opportunities are opening up for robotics.
Illustrations are included.

  28/7/26   (Item 9 from file: 248)
 DIALOG(R)File 248:PIRA
 (c) 2002 Pira International. All rts. reserv.

 00317221   Pira Acc. Num.: 10137896   Pira Abstract Numbers: 03-92-03306
  Title: LOADS BUNDLES ON TO *PALLETS*
  Authors: Anon
  Source: Nord Emballage vol. 57, no. 11, Nov. 1991, p. 46
  ISSN: 0039-6494
  Publication Year: 1991
  Document Type: Journal Article
  Language: Swedish
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 9208
  Abstract: Windab have developed a new automatic *pallet* loader, AP 2000.
It can be programmed to handle varying sizes of paper bundles and load them

into appropriate patterns and *pallet* heights. The machine calculates the *number* of *pallets* needed for each *order*. Its speed is 30 bundles per minute and its *pallet* magazine takes 15 empty *pallets* . Windab manufacture packaging lines for the graphic industries. (Short article)

28/7/27   (Item 10 from file: 248)
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00230565   Pira Acc. Num.: 10033809   Pira Abstract Numbers: 03-91-04145
 Title: **PRESSURE FOR STANDARDS**
  Authors: Anon
  Source: Packag. Week vol. 7, no. 8, 3 July 1991, p. 3
  ISSN: 0267-6117
  Publication Year: 1991
  Document Type: Journal Article
  Language: English
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 9110
  Abstract: Following three years of research, the European Pressure Sensitive Manufacturers Association has published bar code standards, for roll labels and *pallet* labels, based on the structures defined by the International Article Numbering Association. Roll labels will have three bar codes - for product, individual roll and a third containing details such as label size. *Pallet* labels will have three codes, containing the customer's *order* *number*, product code and a serial *number* for the *pallet*. (Short article)

28/7/28   (Item 11 from file: 248)
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00203230   Pira Acc. Num.: 9236127   Pira Abstract Numbers: 03-90-01284
 Title: **DOUBLE CAPACITY IN READINESS FOR THE FUTURE**
  Authors: Anon
  Source: Nord Emballage vol. 55, no. 10, Oct. 1989, p. 32
  ISSN: 0039-6494
  Publication Year: 1989
  Document Type: Journal Article
  Language: Swedish
  Pira Subfiles: International Packaging Abstracts (PK)
  Journal Announcement: 9004
  Abstract: Pripps brewery in Malmo, Sweden invested SEK19m in 1988 in a new filling line for beer and soft drinks in aluminium cans. The main supplier of the filling and packing equipment was Seitz Enzinger Noll (SEN) of West Germany. The top capacity is 1,000 cans a minute. The equipment includes a completely automatic stretch film machine, Octopus 1600 I (Inverker), with a higher capacity than is needed at present. This machine is more than twice as fast as the existing *stacking* machine but the firm expects the *number* of *pallets* to be wrapped to increase in the future. It has a film carriage which rotates round the stationary goods and has a capacity of 80 *pallets* an hour. The advanced electronic control equipment makes it possible to program 10 different kinds of film designs. (Short article)

28/7/29   (Item 12 from file: 248)
DIALOG(R)File 248:PIRA
(c) 2002 Pira International. All rts. reserv.

00183352   Pira Acc. Num.: 8531165   Pira Abstract Numbers: 03-89-00997
 Title: **DON'T LEAVE *PALLETIZING* METHODS TO CHANCE**
  Authors: Beck L

Abstract: Before selecting *palletising* equipment it is advisable to be
as sure as possible about unit specifications, *pallet* specifications,
available space, source points for products and the product mix and
throughput requirements. In terms of equipment the market generally offers
vacuum head units, row-stripping machines and robotic *palletisers*. Having
decided on type, there are still further considerations about the *number*
of *palletisers* needed, *palletising* speeds, *stacking* heights and
patterns and controls. The best solution is often the systems approach,
allowing potential vendors to formulate proposals for a system suited to
the user's requirements. Automatic *palletising* should also be considered
as it can often cut costs significantly in the areas of labour, health and
insurance.

28/7/30   (Item 13 from file: 248)
   **Title: RECOMMENDATIONS, PERTINENT TO THE BASIC WHO RULES (GMP RULES), ON
THE MANUFACTURE OF METAL CLOSURE SYSTEMS**
   Abstract: Recommendations on the manufacture of metal closure systems
such as flanged lids, pilferproof and twist-off caps for pharmaceutical
products are described in general terms. The aspects discussed include
manufacturing quality, cleaning of production lines, the definition of a
batch, quality tests (such as quality control of raw materials, in-process
control, final control, and sampling), alterations in the equipment and
process, the packaging, *pallets* , labels and random sampling. The
packaging used for the closure systems and the *pallets*, must comply with
the regulations in size, quality and standard of cleanliness. Each pack
should be labelled with details of the supplier, customer, packaging
material *number*, customer's *order* *number*, batch *number*, *number* of
items, and a description of the article.
?

2/7/1   (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

013270407   **Image available**
WPI Acc No: 2000-442313/200038
  Object **stacking** method e.g. for **stacking** metal sheets, involves
  extracting object from arrival **stack** to storage **stack** according
  to dimensional hierarchy of sheets
Patent Assignee: JOHANSSON B (JOHA-I)
Inventor: **JOHANSSON B**
Number of Countries: 091 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200035783	A1	20000622	WO 99SE2239	A	19991201	200038	B
SE 9804186	A	20000604	SE 984186	A	19981203	200040	
SE 513167	C2	20000717	SE 984186	A	19981203	200041	
AU 200017021	A	20000703	AU 200017021	A	19991201	200046	
EP 1165408	A1	20020102	EP 99960078	A	19991201	200209	
			WO 99SE2239	A	19991201		
US 20020019681	A1	20020214	WO 99SE2239	A	19991201	200214	
			US 2001872481	A	20010602		

Priority Applications (No Type Date): SE 984186 A 19981203
Patent Details:

Patent No	Kind Lan Pg	Main IPC	Filing Notes
WO 200035783	A1 E 28	B65G-001/00	

    Designated States (National): AE AL AM AT AU AZ BA BB BG BR BY CA CH CN
    CR CU CZ DE DK DM EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP
    KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX NO NZ PL PT RO RU SD SE
    SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW
    Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR
    IE IT KE LS LU MC MW NL OA PT SD SE SL SZ TZ UG ZW

SE 9804186	A	B65G-001/00	
SE 513167	C2	B65G-001/00	
AU 200017021	A	B65G-001/00	Based on patent WO 200035783
EP 1165408	A1 E	B65G-001/00	Based on patent WO 200035783

    Designated States (Regional): AT BE CH CY DE DK ES FI FR GB GR IE IT LI
    LU MC NL PT SE

US 20020019681	A1	G06F-019/00	Cont of application WO 99SE2239

Abstract (Basic): WO 200035783 A1
     NOVELTY - A control unit (10) receives user input corresponding to
     dimension and variety of the object. Based on the information, the
     control unit controls a collector (5) to extract the objects from
     arrival **stack** (2) to the storage **stack** (3). When the
     arrangement of objects in **stacks** is non-uniform, the collector
     replaces the objects repeatedly until they are arranged in orderly
     fashion.
     DETAILED DESCRIPTION - The objects in the arrival and storage
     stacks (2,3) are searched and when user request unmarked object
     exists in the **stacks**, the object is marked with a sequence number
     according to the desired withdrawal order. The **stack** (1) which has
     lowest order unmarked object above the marked object is assigned as
     stack category (A) and other **stack** (3) as category (B). When
     unmarked object exists above lower order object in category (A), it is
     moved to **stack** of category (B) until all the unmarked objects above
     lowest order object are removed from **stack** category (A). When
     unmarked or marked objects exist above lowest order object in **stack**
     category (B), the unmarked object is conveyed to another **stack** in
     same category (B) and marked object is conveyed to **stack** category
     (A), until all the marked objects are in category (A). The collector
     then moves the higher order object from **stack** category (A) to
     stack category (B) which accommodates object of next successive
     dimension, else to empty **stack** (3) until **stack** category (A) is

Karen Lehman EIC 3600 September 27, 2002

empty. When the objects are not arranged in uniform fashion according to their dimension, the collector moves the non-uniform object from **stack** category (B) to **stack** category (A) and repeats the collection steps.

USE - For **stacking** objects such as metal sheets in warehouse, production store.

ADVANTAGE - As the storage and the extraction is automated through communication control circuit, extraction and storage of objects is performed rapidly. Storage space is reduced.

DESCRIPTION OF DRAWING(S) - The figure shows the model of **stack** assembly.

```
      **Stacks** (1-3)
      Collector (5)
      Control unit (10)
      pp; 28 DwgNo 1/10
```
Derwent Class: Q35; T06; X25
International Patent Class (Main): B65G-001/00; G06F-019/00

2/7/2   (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

004420647
WPI Acc No: 1985-247525/198540
  Metal plate handling and storage unit - involves lifting device moving backwards and forwards horizontally in two directions at right-angles to each other
Patent Assignee: TRIVET AB (TRIV-N)
Inventor: **JOHANSSON B**
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SE 8400809	A	19850816	SE 84809	A	19840215	198540	B

Priority Applications (No Type Date): SE 84809 A 19840215

Abstract (Basic): SE 8400809 A
      The **stacked** metal plates are removed one by one from the storage unit and placed in a **stack** in a station at the side of the **stacks** in the store. The store is so loaded that the plates to be used firstly are located uppermost.
      The plates are removed from the store by a lifting device which travels horizontally in two directions at right-angles to each other, and backwards and forwards closely to the **stacks** of metal plates.
      USE - Sequence feeding arrangement for metal plates required to be passed to a machining process from a storage unit.
      1
Derwent Class: Q35
International Patent Class (Additional): B65G-060/00

2/7/3   (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

002356855
WPI Acc No: 1980-G3306C/198029
  Forklift safety cage for palleted **stacked goods - has pivotal side to permit lifting entirely free for loading**
Patent Assignee: JOHANSSONS G BIL-OC (JOHA-N)
Inventor: **JOHANSSON B G**
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week

Abstract (Basic): SE 7812377 A
        The safety cage is for use with pallet fork lifters, where pallets
    bearing **stacked** goods are moved from place to place or lifted to
    heights and where a slide of **stacked** goods could cause injury or
    material damage. The cage can be adjusted in an open, raised position
    for on and off loading, in which position the region of the fork's
    lifting gear is left entirely free.
        In the travelling position the cage surrounds the **stacked**
    goods, preventing any shifting off the pallet. It can be fitted to
    pallet forks of varying form.
Derwent Class: Q38
International Patent Class (Additional): B66F-009/12

   2/7/4   (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

002126007
WPI Acc No: 1979-E5938B/197921
    Spark gap made of **stack of discs - has each disc with electrodes on
    both sides, connected with each other through hole in the disc**
Patent Assignee: ASEA AB (ALLM)
Inventor: **JOHANSSON B**; NILSSON E
Number of Countries: 004 Number of Patents: 004
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 2846635	A	19790517				197921	B
SE 7712756	A	19790618				197927	
US 4194138	A	19800318				198013	
CH 632107	A	19820915				198241	

Abstract (Basic): DE 2846635 A
        The discs are made of an arc resistant insulating material. They
    form between them cavities for arcs. Each disc carries on each side a
    metal electrode, electrically and mechanically connected through a hole
    in the disc. At least one electrode on each disc forms an ignition gap
    with the electrode on the adjacent disc.
        Each electrode (5, 6) has a projection (7) fitting into the
    through hole (8) in the corresponding disc (1-4). The disc has a
    projection (16) on at least one side, which fits into the electrode
    projection
Derwent Class: V05; X12; X13
International Patent Class (Additional): H01J-001/92; H01T-005/00;
  H02H-009/06
?

DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

012572430   **Image available**
WPI Acc No: 1999-378537/199932
  Solid state image pick-up element for electronic camera - has scanner
  that outputs image signal by collecting electric signal stored in
  registers for specific number of pixels
Patent Assignee: NIKON CORP (NIKR)
Number of Countries: 001 Number of Patents: 001
Patent Family:
Patent No   Kind Date   Applicat No   Kind Date   Week
JP 11146278   A   19990528 JP 97311733   A   19971113 199932 B

Priority Applications (No Type Date): JP 97311733 A 19971113
Patent Details:
Patent No   Kind Lan Pg   Main IPC   Filing Notes
JP 11146278   A   21 H04N-005/335

Abstract (Basic): JP 11146278 A
      NOVELTY - The electric signals output by each pixel (10) through
    vertical reading lines (15), sequentially are received by respective
    horizontal scanners (20). Each scanner has registers (18s,18d,19s,19d)
    in which temporary storage of electric signal is carried out. Another
    scanner outputs the image signal by collecting electric signals from
    registers for specific number of pixels. DETAILED DESCRIPTION - The
    pixels (10) that generate electric signal corresponding to received
    light quantity are *arranged* in matrix shape. The vertical reading
    lines (15) are *arranged* for every vertical row of the pixels. The
    electric signal from each pixel is output to a scanning circuit (17),
    sequentially through the vertical reading lines.
      USE - For electronic camera.
      ADVANTAGE - Facilitates effective reading of data with *high* as
    well as *low* resolution. Reduces *number* of pixels that are to be
    scanned during reading. Improves reading speed of low resolution
    display data to reduce total reading time. Facilitates smooth display
    of activity of *object* in monitor by shortening updating space of one
    frame. Avoids need for image processor to process low resolution
    display data. Facilitates easy adjustment of aspect ratio of image
    signal. Reduces size of camera having monitor. Shortens time interval
    between image pick-up and image data display. Facilitates exact
    judgment of shutter state by reducing time lag of monitor. Facilitates
    easy and reliable adjustment of drive time of image pick-up element.
    DESCRIPTION OF DRAWING(S) - The figure shows the circuit diagram of
    solid state image pick-up element. (10) Pixels; (15) Vertical reading
    line; (17) Scanning circuit; (18d,18s,19d,19s) Registers; (20)
    Horizontal scanners.
      Dwg.1/16
Derwent Class: U13; W04
International Patent Class (Main): H04N-005/335
International Patent Class (Additional): H01L-027/146

DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

011461323   **Image available**
WPI Acc No: 1997-439230/199741
  Objective lens for e.g. microscope - has diffraction type optical
  component *arranged* between radius of emission pupil and merging null
  ray amount located above pupil position of meniscus lens
Patent Assignee: OLYMPUS OPTICAL CO LTD (OLYU)
Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 9197283	A	19970731	JP 9620620	A	19960112	199741	B

Priority Applications (No Type Date): JP 9620620 A 19960112
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 9197283	A		15	G02B-021/02	

Abstract (Basic): JP 9197283 A
        The lens has a meniscus lens provided as a whole power which is
    divided in two groups. The first group which has a positive power,
    contains the joining lens of the meniscus lens and another one lens
    that turns concave to a respective *object* side.
        The concave turning lens of the first group has a diffraction type
    optical component which makes up the second group. The optical
    component is *arranged* between the radius of an emission pupil and the
    small position of a merging null ray amount which is located on the
    axis above the pupil position of the imaging lens of the optical
    system.
        ADVANTAGE - Ensures satisfactory corrections of various aberrations
    of chromatism without overusing e.g. joining lens, abnormal and
    dispersed lens which has *high* *numerical* aperture but *low*
    magnification. Obtains coupling lens system since configuration of
    object lens is simplified. Enables wide view observation of *object*
    side without changing objective lens.
        Dwg.1/25
Derwent Class: P81
International Patent Class (Main): G02B-021/02

 23/7/3   (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

009400644   **Image available**
WPI Acc No: 1993-094153/199311
 **High aperture finite conjugate lens system for use in e.g. laser thermal
 printer - has high numerical aperture on both *object* and image side of
 lens system having aperture stop located at centre of system and lens
 elements centred on optical axis in groups**
Patent Assignee: EASTMAN KODAK CO (EAST)
Inventor: BAEK S H; DEJAGER D; BAEK S
Number of Countries: 017 Number of Patents: 008
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9304391	A1	19930304	WO 92US6885	A	19920818	199311	B
EP 554440	A1	19930811	EP 92918856	A	19920818	199332	
			WO 92US6885	A	19920818		
US 5258777	A	19931102	US 91749394	A	19910823	199345	
US 5272568	A	19931221	US 91805164	A	19911211	199351	
US 5274503	A	19931228	US 91749396	A	19910823	199401	
JP 6501792	W	19940224	WO 92US6885	A	19920818	199413	
			JP 93504494	A	19920818		
EP 554440	B1	19971112	EP 92918856	A	19920818	199750	
			WO 92US6885	A	19920818		
DE 69223130	E	19971218	DE 623130	A	19920818	199805	
			EP 92918856	A	19920818		
			WO 92US6885	A	19920818		

Priority Applications (No Type Date): US 91805164 A 19911211; US 91749394 A
    19910823; US 91749396 A 19910823
Cited Patents: US 4753522; US 4955701
Patent Details:
Patent No Kind Lan Pg   Main IPC   Filing Notes

                    Karen Lehman EIC 3600 September 27, 2002

both *object* and image sides of the lens system.The lens system has six lens components, the first lens component is identical to the sixth lens component but is reversed in orientation; and the third lens component is identical to the fourth lens component, but is reversed in orientation.

One of the lens groups is located to one side of the aperture stop and another of the lens groups is located to a second side. The lens groups each comprises an outer-most lens element and an inner-most lens element. The inner-most lens element of each group is located in close proximity to the aperture stop, and has a convex surface facing towards the aperture stop, wherein the high numerical apertures of the lens system are at least 0.15 or higher.

USE/ADVANTAGE - A well corrected high aperture finite conjugate micro relay lens system having high numerical aperture on both *object* and image sides of the lens such as in a laser thermal printer system, for projecting a fibre optic-laser diode linear array onto a thermally sensitive medium in a printer. Exhibits low cost in mfr.

Dwg.1/1

US 5258777 A

The thermal imaging appts. includes an imaging drum *arranged* to mount a receiver and a donor in superposed relationship on it, and a unit for rotating the drum about an axis. A unit generating a number of modulated coherent light beams and a light projector projects the light beams onto the donor to transfer an image onto the receiver by transfer of a dye from the donor member.

The light projector includes a finite conjugate lens system having high numerical apertures of at least about 0.2 on both *object* and image sides and the lens system includes an aperture stop located approximately at a centre of the lens system. A number of lens elements are centred on an optical axis and *arranged* into two lens gps. of positive power to provide the high numerical apertures on both *object* and image sides of the lens system.

ADVANTAGE - Multiple lens scanning printhead with very fast lens relaying system.

Dwg.1,2/6

Derwent Class: P75; P81; T04
International Patent Class (Main): B41J-002/435; G02B-009/62; G02B-013/24; G02B-021/02
International Patent Class (Additional): B41J-002/32; B41J-002/44; G02B-009/00

23/7/4   (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

009055918   **Image available**
WPI Acc No: 1992-183308/199222
   Computer memory pyramidal addressing method - storing data in multi-level progression and combines lower level *items* to form higher levels in pyramid
Patent Assignee: HOLTZ K (HOLT-I)
Inventor: HOLTZ K
Number of Countries: 001   Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 5113505	A	19920512	US 89316925	A	19890228	199222	B
			US 89446296	A	19891204		

Priority Applications (No Type Date): US 89446296 A 19891204; US 89316925 A 19890228
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5113505	A		9	G06F-012/02	Div ex application US 89316925

Karen Lehman EIC 3600 September 27, 2002

Abstract (Basic): US 5113505 A
     The method involves inputting the lower level node addresses into a
buffer and inputting one of a *number* of *lower* or *higher* node
addresses which has not been processed into a register from the buffer.
The number of leading zeroes in the one address indicates if the
address is an odd or even level. A number of matching node address are
generated where matching node addresses are those with a common parent
node.
     Depending on the odd or even status of the one address either X or
Y address bits are selected from it, and at least one matching node
address obtained, the matching address containing one of all the
combinations of either X or Y bits. The next higher level node address
is obtained from one of the matching node addresses by right shifting
the X or Y portion of the latter by the number of X or Y bits. If the
number of leading zeroes indicates that the highest level address has
not been attained, then the next higher level address is stored in the
buffer. If the buffer contains more unprocessed lower or higher level
addresses then they are selected individually as the one address for
which matching address nodes are generated.
     ADVANTAGE - Can identify any arbitrary large group of data words
with a single address by *manipulating* the address pattern.
     Dwg.2/4
Derwent Class: T01
International Patent Class (Main): G06F-012/02

 23/7/5   (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

009023768   **Image available**
WPI Acc No: 1992-151142/199218
 **Conversion of movements of *objects* into code - converting electric
 signals, corresp. to lower code orders, into four-phase shifted signals,
 used to eliminate effect of instrumental inaccuracy**
Patent Assignee: A ARMN RADIOPHYS (AARA-R)
Inventor: BABAIAN S K; SARKISIAN R A; VARDANIAN G G
Number of Countries: 015 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9206539	A	19920416	WO 90SU227	A	19901002	199218	B

Priority Applications (No Type Date): WO 90SU227 A 19901002
Cited Patents: EP 212662; EP 262881; SU 1200419; SU 1312735; SU 1401605; US
   4412206
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9206539	A	R	52		

   Designated States (National): FI JP US
   Designated States (Regional): AT BE CH DE DK ES FR GB IT LU NL SE
Abstract (Basic): WO 9206539 A
     During movement of a coded element (1), reading elements (2,3) form
electric signals modulated as a code of movement and a signal caused by
instrumental inaccuracy of manufacture and installation of the coded
element (1) and variation of the parameters of the reading elements
(2,3). To eliminate the distortion effect of instrumental inaccuracy,
signals corresp. to the lower orders pass to a forming unit (4),
converting them into four electric equal amplitude signals with
successive mutual 90 deg. phase shifts.
     These signals pass with a 180 deg. phase shift from an
interpolator (5) to the inverting and non-inverting inputs of a unit
(6) of comparators. The lower orders of the signal are formed by the
comparator unit (6) and logic processing unit (7) and passed to a
converter (11), also receiving the cyclic code of the higher orders,
formed by another unit (8) of comparators, a converter (9) and a logic

processing unit (10). The converter (11) converts the *codes* of
lower and *higher* orders into binary *code*.
        USE - For high precision measurement of *moving* *objects* in NC
machine, multi-axis swinging platforms (stages), tachometer, robot,
manipulator.
        Dwg.4/17
Derwent Class: S02; U21; X25
International Patent Class (Additional): H03M-001/22

 23/7/6   (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

008182761   **Image available**
WPI Acc No: 1990-069762/199010
  **Two-sided copying method for digital copier - reading documents with CCD
  sensor, printing out odd pages, then inverting *sheets* for even pages**
Patent Assignee: RICOH KK (RICO)
Number of Countries: 002 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
JP 2020880	A	19900124	JP 87335274	A	19871229	199010	B
US 4910612	A	19900320	US 88291603 .	A	19881229	199017	

Priority Applications (No Type Date): JP 87335274 A 19871229
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
JP 2020880	A		10		

Abstract (Basic): JP 2020880 A
        The two-sided copying method involves sequentially feeding
    documents to be read by a CCD image sensor and stored in a memory in
    the form of digital image data. The data representing odd pages is
    sequentially read out of the memory the *highest* or the *lowest*-
    numbered page first. The image data is printed out on one side of
    individual paper *sheets*. The resulting one-sided copies are
    temporarily *stacked* on a two-sided tray device. The image data for
    even pages of the documents are read out of the memory with the
    lowest or the *highest*-*numbered* page first. The one-sided copies
    are refed from the two-sided tray device so that the image data
    associated with the even pages are reproduced on the other side of the
    individual one-sided copies. The resulting two-sided copies are driven
    out of the copier to a tray in the correct order. ADVANTAGE - Increased
    processing rate.
        (Major country equivalent to J02020880) (19pp Dwg.No.1/7
Derwent Class: P84; S06; W02
International Patent Class (Additional): G03G-015/00; H04N-001/04

 23/7/7   (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

003774699
WPI Acc No: 1983-770921/198338
  **Optical knife edge system using electric light source - enabling testing
  of high numerical aperture optics using microscope objective to gather
  light from pinhole**
Patent Assignee: SANDERS ASSOC INC (SAND)
Inventor: KUPPENHEIM J D
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 4402602	A	19830906				198338	B

Priority Applications (No Type Date): US 81276219 A 19810622
Patent Details:
Patent No   Kind Lan Pg   Main IPC   Filing Notes
US 4402602   A   7

Abstract (Basic): US 4402602 A
        An auxiliary lens matches the f-number in one direction of the
     optic under test. The user can use the knife edge system to test optics
     having *high* *numerical* apertures (*low* f-*numbers*) since the
     f-number in the front focal plane of the auxiliary lens will also be
     low and will permit filling the large *object* under test with light.
     Since the back f-number of the auxiliary lens will be large, the lens
     itself will be easily filled with light from even a small pinhole
     outputting a very narrow bundle of light.
        The knife edge system includes a special eye piece which, in
     conjunction with the auxiliary lens, forms a telescope focused at the
     surface of the optic when the image is not cut off by the knife edge.
     In a second *arrangement*, a further lens relays the back focal plane
     of the auxiliary lens to a position near the eye piece which allows use
     of a smaller focal length eye piece and, hence, results in a larger
     image to the observer.
        2/4
Derwent Class: S02
International Patent Class (Additional): G01B-009/00

 23/7/8   (Item 8 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

001272262
WPI Acc No: 1975-F6169W/197521
  **Objective lens system for use in microscopes - uses small number of
  lenses to form apochromatic lens**
Patent Assignee: OLYMPUS OPTICAL CO LTD (OLYU)
Number of Countries: 002 Number of Patents: 002
Patent Family:
Patent No   Kind   Date   Applicat No   Kind   Date   Week
US 3883231   A   19750513   197521 B
DE 2238036   B   19800925   198040

Priority Applications (No Type Date): JP 7158354 A 19710804

Abstract (Basic): US 3883231 A
        The lens system comprises; a first single lens having a positive
     refractive power and made of a general optical glass having a *high*
     refractive index and *low* Abbe's *number*; a second component
     consisting of a compound lens having a negative refractive power; the
     first and second components constituting a front lens system having a
     negative refractive power; a third component consisting of a single
     lens having a positive refractive power and made of an optical glass
     having a high Abbey's number; and a fourth component consisting of a
     compound lens having a positive refractive power. The third and fourth
     components constitute a rear lens system having a positive power, and
     all lenses are *arranged* in succession from the side of an *object*,
     and which is defined by six specific conditions.
Derwent Class: P81
International Patent Class (Additional): G02B-009/34; G02B-021/02

 23/7/9   (Item 1 from file: 347)
DIALOG(R)File 347:JAPIO
(c) 2002 JPO & JAPIO. All rts. reserv.

                    Karen Lehman EIC 3600 September 27, 2002

04090382   **Image available**
HIGH SENSITIVITY AND HIGH RESOLUTION MEASURING DEVICE OF LIQUID
CHROMATOGRAPH MASS SPECTROMETRIC DEVICE

ABSTRACT
PURPOSE: To provide a means to sense spectrum stably, which controls
parameters about control *items* at a *high* speed from a *low* mass
number to a high without *resorting* to a devoted control computer.

CONSTITUTION: A specimen separated from an LC 1 is atomized by an atomizing
part 2, passed through a solvent removing part 3, and ionized with a high
voltage which is impressed through a needle electrode 4. The ionized
specimen is dissociated by the drift voltage 9 impressed between the first
thin hole 5 and second thin hole 6, converged by a focusing lens 11, and
subjected to mass dispersion made by a mass spectrographic part 13. The
ions after mass dispersion are deflected by a deflecting electrode 14 and
sensed by a sensor 16. A control part 17 controls parameters while the
setting of the timing and address from a control CPU to a memory is made in
synchronization with mass- dispersion signals independently from
change-over control CPU and the output value of a shift register to control
the mass dispersion signals
?

24/7/1   (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

007765870   **Image available**
WPI Acc No: 1989-030982/198904
   **Queue system servicing modelling circuit - has logic gates pulse counter
   comparator generators and register**
Patent Assignee: MAKARCHUK A M (MAKA-I)
Inventor: ADAMENKO Y U V; KRETININ O L
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
SU 1410052	A	19880715	SU 4137279	A	19861014	198904	B

Priority Applications (No Type Date): SU 4137279 A 19861014
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
SU 1410052	A		5		

Abstract (Basic): SU 1410052 A
      Circuit contg. logic gates (15-30) up-down counters (22) and
   generators (30,31) is augmented with additional logic gates (2,36,39)
   pulse counter (32), comparator (37), generators (30,31) and a register
   (33).
      Circuit allows a *number* of *high* and *low* access *codes*
   number of referrals and number of *requests* evaluation and
   operational cycles monitoring with empty channel indicators.
      USE/ADVANTAGE - In computer engineering for queue servicing
   systems analysis. *Arrangement* increases the functional range by
   introducing reliability priority access. Bul.26/15.7.88 Bul.26/15.7.88
Derwent Class: T01
International Patent Class (Additional): G06F-015/20

24/7/2   (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2002 Thomson Derwent. All rts. reserv.

004605246
WPI Acc No: 1986-108590/198617
   **Dynamically allocated local-global storage system - for multi-processor
   system by assigning first and second storage portions to reference and
   any other processor respectively**
Patent Assignee: INT BUSINESS MACHINES CORP (IBMC); IBM CORP (IBMC)
Inventor: BRANTLEY W C; MCAULIFEE K P; NORTON V A; PFISTER G F; WEISS J
Number of Countries: 007 Number of Patents: 009
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
GB 2165975	A	19860423	GB 8525903	A	19851021	198617	B
EP 179401	A	19860430	EP 85113174	A	19851017	198618	
CA 1236588	A	19880510				198823	
CN 8507534	A	19870415				198827	
US 4754394	A	19880628	US 84664131	A	19841024	198828	
GB 2165975	B	19880720				198829	
US 4980822	A	19901225	US 88168721	A	19880316	199103	
EP 179401	B1	19920722	EP 85113174	A	19851017	199230	
DE 3586389	G	19920827	DE 3586389	A	19851017	199236	
			EP 85113174	A	19851017		

Priority Applications (No Type Date): US 84664131 A 19841024; US 88168721 A
   19880316
Cited Patents: 1.Jnl.Ref; A3...8937; No-SR.Pub; US 3796996; US 3820079
Patent Details:

```
Patent No  Kind Lan Pg    Main IPC    Filing Notes
GB 2165975     A      12
EP 179401      A  E
   Designated States (Regional): DE FR GB IT
EP 179401      B1 E     G06F-012/02
   Designated States (Regional): DE FR GB IT
DE 3586389     G         G06F-012/02   Based on patent EP 179401
```

Abstract (Basic): GB 2165975 B

A table look-up provides a quantity, the interleave amount, which indicates whether the real address is in local or global storage and, which in the latter event, is used to derive the absolute addresses. The low order bits of the real address may be hashed using Remap (252) to introduce a random element into a sequence of consecutive addresses. The rear address after mapping excluding the word offset (WO) is passed to right rotate device (256) which is controlled by the interleave amount.

The width of the field to be rotated and the amount the field is to be rotated are specified by the interleave amount. The derived absolute addresses are entered in register (258) and are passed for use onto a communication network interconnecting the processors and the storage system. Local and global storage is distributed amongst the nodes of a multiprocessor network. (12pp Dwg.No.7/8)

Abstract (Equivalent): GB 2165975 B

Data processing apparatus comprising a communications network having plural individually addressable ports with a processor and a storage unit connected to at least some, and potentially all, of the ports providing addressable processing nodes, the network being *arranged* to support node address containing message passing from any originating processing node and the addressed node, each processor incorporating a table driven, virtual to real address translation facility and an interface mechanism, in part controlled thereby, providing bi-directional communication between the processor, its connected port and the local storage unit, the translation facility responding to a virtual address from the processor to derive a processing node address which, if it is the local processing node address, causes the interface to connect the processor and the local storage unit and, if it is not the local processing node address, to connect the processor and the network via the local port and a message cotnaining the generated other node address, and hence, indirectly, to the addressed processing node, the interface mechanism at the addressed processing node connecting the port to the storage unit local to that port, the translation control tables being writable at run time to match the requirements of applications, whereby the real address space of any particular processor is variably divided between its local storage unit and global storage in the form of the aggregate of the storage units in other processing nodes, and the local storage unit is equally variably divided between local storage and global storage, directly by the translation defined by the local translation control tables.

Abstract (Equivalent): US 4980822 A

The method comprises the steps of mapping virtual addresses of storage reference *requests* produced by processors to real addresses, each of the real addresses having high-order bits for identifying one of the memory modules in one of the processing nodes and low-order bits for identifying a storage location in the identified memory module and selectively swapping a variable number of the high-order bits for the same number of the low-order bits of the real addresses to generate corresponding absolute addresses.

Further steps include controlling the selective swapping under the dynamic control of the processors during run time providing swapping information which specifies the *number* of said *high*-order bits and *low*-order bits to be swapped and directing the storage reference *requests* from each processor in accordance with the absolute addresses to either the memory module in its respective processing

nodeor to other memory modules in remote processing nodes via the communication network.

USE - Multiprocessing system with processing nodes interconnected together by communication network, each node incl

US 4754394 A

The multiprocessing system includes a map/interleave block for applying variable interleaving transformation to the real addresses of the storage reference *requests* produced by the processor, the real addresses transforming to corresp. absolute addresses with each absolute address identifying one of the memory modules and a storage location. A controller, under the dynamic control of the processor responding to the user software during run time operates on the map/interleave block to interleave the absolute addresses across varying numbers of memory modules.

A device coupled to the map/interleave block directs storage reference *requests* in accordance with the absolute addresses to the respective identified memory modules and locations. Blocks of absolute addresses are dynamically interleaved across variable numbers of the memory modules as specified by the controller.

ADVANTAGE - Allows storage configuration to be dynamically altered to fit needs of user and improves performance over wide range of application. (11pp

Derwent Class: T01
International Patent Class (Main): G06F-012/02
International Patent Class (Additional): G06F-009/31; G06F-012/06; G06F-012/10; G06F-013/00; G06F-015/16
?

DIALOG(R)File 347:JAPIO

03119527   **Image available**
MULTI-*ITEM* INFORMATION INPUT DEVICE

PUB. NO.:   02-095027 [JP 2095027 A]
PUBLISHED: April 05, 1990 (19900405)
INVENTOR(s):   YOSHIKAWA NOBUHIRO
                KOBAYASHI HIDEO
APPLICANT(s):   ANRITSU CORP [330013] (A Japanese Company or Corporation), JP
                (Japan)
APPL. NO.:   63-248099 [JP 88248099]
FILED: September 30, 1988 (19880930)

ABSTRACT
PURPOSE: To shorten the retrieving time of an *item* by arranging the
item with a high using frequency with a special rule and making it easy
to see it at the time of retrieving.

CONSTITUTION: A control means 20 provides an editing means 7 of an *item*
file and using frequency information is edited as necessary. For example,
by the using frequency, the information after an output *code* is re-
arranged in the *high* sequence or the *low* sequence of the using
frequency. The arrangement is executed from the first page in the high
sequence of the using frequency or the arrangement is executed from
upper-left to lower-right at respective pages. Consequently, it is made
easy to see and thus, edited displaying information is displayed through a
displaying control means 9 to a display device 10. Thus, the retrieving
time of the *item* can be shortened.

DIALOG(R)File 347:JAPIO

02436058   **Image available**
PALLET DISPLACEMENT DEVICE

PUB. NO.:   63-052958 [JP 63052958 A]
PUBLISHED: March 07, 1988 (19880307)
INVENTOR(s):   MURASHIMA TAKASHI
                FUTAMURA TAKASHI
APPLICANT(s):   MEIDENSHA ELECTRIC MFG CO LTD [000610] (A Japanese Company or
                Corporation), JP (Japan)
APPL. NO.:   61-193626 [JP 86193626]
FILED: August 19, 1986 (19860819)

ABSTRACT
PURPOSE: To make it possible to determine the order of processing steps
after a workpiece is set, by indicating the preference order numbers and
processing numbers of workpieces, which are set by a central control
section, respectively on a display section.

CONSTITUTION: If it is desired that the preferential order numbers and
working *numbers* of workpieces are *rearranged* successively in the order
from the *higher* preference to the *lower* preference, when a manipulating
part 5b in a central control section 5 controls a scheduler control part 5a
through a supervising control part 5c or a set switch on the control part
5a is set, and therefore, the number of a workpiece having the highest
preferential order and the working number thereof are delivered to a
machining center and a numerical control device 6 from the monitor part 5d.

Further, the number of the workpiece is fed to a carrier vehicle 7 through a carrier vehicle control part 5e. Thus, the determination of working order of the workpieces may be made after setting of the workpiece, and therefore, it is not necessary to determine the supply order of workpieces. Accordingly, it is possible to cope with the case of workpieces which should be urgently worked, by making the preferential orders thereof higher.
?

```
****--------------------------------------------------------------------------****
*      26 PAGES              893 LINES              JOB  71731   100J1V       *
*   5:15 P.M. STARTED    5:16 P.M. ENDED                  09/27/02            *
****--------------------------------------------------------------------------****
****--------------------------------------------------------------------------****
*                        EEEEE      N   N      DDDD                           *
*                        E          N   N      D   D                          *
*                        E          NN  N      D   D                          *
*                        EEE        N N N      D   D                          *
*                        E          N  NN      D   D                          *
*                        E          N   N      D   D                          *
*                        EEEEE      N   N      DDDD                           *
*                                                                            *
****--------------------------------------------------------------------------****
****--------------------------------------------------------------------------****
```

SEND TO: LEHMAN, KAREN
         PATENT & TRADEMARK OFFICE
         1911 S CLARK ST
         ARLINGTON, VIRGINIA 22202-3503

MAIL-IT REQUESTED: SEPTEMBER 27, 2002   100J1V

          CLIENT: BUTLER
         LIBRARY: NEWS
            FILE: ALLNWS

YOUR SEARCH REQUEST AT THE TIME THIS MAIL-IT WAS REQUESTED:
 DATE BEF 12/3/98 AND ATLEAST4(PALLET!) AND ATLEAST2(COMPUTERI! OR AUTOMAT!)
    AND (BARCODE! OR NUMBER! OR CODE OR ID OR IDENTIF!) AND ATLEAST3(STACK!)

NUMBER OF STORIES FOUND WITH YOUR REQUEST THROUGH:
     LEVEL 1...   237

LEVEL   1 PRINTED

THE SELECTED STORY NUMBERS:
62

DISPLAY FORMAT: FULL

*******************************08368*********************************

HEADLINE: Right order: order picking devices keep the flow of inventory moving

BODY:

To improve your supply chain prowess, you might want to focus on how inventory is currently being picked by warehouse personnel. If changes need to be made, the following are just some of the many products on the market that can help you achieve desired material handling gains.

A new series of heavy-duty electric lift trucks has been introduced by Crown Equipment Company. Available in four different models, SP 3000 stock pickers offer lifting heights from 126 inches to 312 inches. The mast design nests cylinders, hoses, cables and chains out of the sight line. The company says pulleys are angled to increase visibility and cross braces are located strategically to remain out of the way, regardless of lift height.

An information display panel is featured on the operator's platform, indicating steer tire direction, showing messages, and displaying battery charge status with lift interrupt. The display also houses a 16-fault history, six-hour metres, an elapsed-time counter, wire-guidance status lights, and other maintenance or operation-related functions.

As a manufacturer and supplier of document processing systems, Xerox wanted to optimize its supply chain to support customer service, lower operating costs, and reduce warehouse inventory and order cycle time. In order to achieve these objectives, Xerox recently installed Optum Software's warehouse management system (WMS). The implementation of WMS has reportedly allowed Xerox to reduce the **number** of its distribution centres by half.

On receipt in Xerox's Webster, New York-based Americas Logistics Center, products are either cross-docked, sent to a pre-pack area or putaway in reserve storage. Before storage, half the inbound shipments are directed to the kitting/pre-pack area to be suitably packaged. **Automatic** cross-docking of pre-allocated receipts increases productivity by eliminating the time spent in storing and picking products, which are available for shipment.

Based on a set of configurable rules, Optum's WMS directs products to be put away. WMS assigns parts to storage locations based on part number, velocity, size, weight, country of origin, and quantity criteria. The main storage methods in the Americas Logistics Center are:

Very-narrow aisle bin-box storage: This storage system is designed for slower moving parts. Part velocity and storage size determine the location of a specific part. In order to maximize storage via directed putaway, all locations and parts are sized and cubed on the system.

Bulk storage and deep racking: This area is used primarily for floor storage and oversized material. To locate faster-moving material closer to the forward-pick area, a combination of floor location and deep racking is used and arranged. The floor locations are designed to maximize the cube, without sacrificing truck and fork mobility.

Very slow/no movers: This area uses a Stanley Vidmar system and mezzanine bin-box storage to provide high-density, maximum cube utilization storage media for extremely low usage parts, while allowing for easy accessibility.

Very narrow-aisle pallet racks: Medium to fast-moving parts in this area, are picked and stored using wire-guided turret trucks. Pick and drop-off points have been designed to maximize turret truck productivity. For any given part number, each pallet position has less than six pallets.

Forward-pick area: The fastest moving parts are stored in this two-storey area, which has floor pallet positions and carton-flow racks on the first floor. Conventional bin-box shelving is on the mezzanine, and the fixed locations are replenished from reserve storage.

Orders to be fulfilled are downloaded from the enterprise hosts to WMS. Orders may proceed manually or automatically. Customer service and emergency orders are typically processed automatically, because of their high priority. Order type, part number, quantity requested, destination, and time of day determine how and when the task will be completed.

Once WMS allocates inventory and assigns a pick location, orders are downloaded from the enterprise system. They're then fulfilled from the forward-pick and bulk-storage area. Sent directly to the consolidation area, non-conveyable items bypass the sorter and conveyor. When items are to be picked from the forward-pick area, WMS calculates and assigns the appropriate cartons, based on the cube of the parts to be packed.

After the carton has been finalized, it's assigned to one of 100 tilt-tray sorter chutes. The batch-picked totes from the forward-pick area are sent

to the tilt-tray induction station, where an operator scans and places each part on a tray. The system **automatically** directs the parts to the appropriate chute for that order. When the incoming totes have been completely sorted, the items are packed into the box and sent to the shipping and staging area.

Industriever vertical-lift storage systems from Kardex help to speed storage and retrieval in a variety of applications. The system uses vertical space up to 31-feet-high to store material in a small footprint, reducing walking and search time. According to the company, delivery of storage pans is up to three times faster than a comparably sized vertical carousel, because each system module works independently.

Cushman's Stock Chaser three-wheel vehicle from Ransomes America Corp. is designed to meet the order processing needs of large warehouse and distribution centres. One feature is the operator's stand-up position, which enables him/her to get on and off the vehicle easily. A combination ladder/backrest provides operator access to high-storage areas. The vehicle comes with a standard 24-volt electrical system. A 36-volt option is available by changing chargers, motor and adding batteries to the compartment.

Schaefer System International introduces its new Transtac line--seven returnable and **stackable** containers that are designed to meet AIAG (Automotive Industry Action Group) standards. They're also compatible with 45-inch-by-48-inch **pallets.** The company says the containers are ideal for closed-loop transportation between the manufacturer, distributor, and retailer. Features include ergonomic handles on two sides and textured areas for adhesive labels. They're also available in solid or perforated models.

Narrow-aisle order pickers from Caterpillar Lift Trucks are available in 24- and 36-volt power and lift heights of over 30 feet. The company says operator comfort is designed into the vehicle's control centre, which features a state-of-the-art, multi-function control handle. To improve productivity, all models feature a high-visibility mast and a large, 1,748-square-inch pick window. Pneumatic cylinder-assisted side gates eliminate pinch points and nest out of the pick area.

Pflow Industries' U series of vertical lifts is designed to move loads to mezzanines, between floors or conveyor levels. The company says the lifts are suited for high-cycle applications that require light-duty vertical lifting of boxes, cartons, barrels, sacks, cases or loose parts. Completely self contained and supporting, the unit lifts up to 300 pounds. The carriage is lifted and lowered by heavy-duty roller chain attached to a mechanical lifting mechanism.

Loadbank International recently installed a remote controlled flow-through

storage system at Erith Edible Oils' (EEO) new plant in Erith, Kent. Reportedly, it's the first of its kind to be used in the United Kingdom. EEO packages and distributes refined edible oils. For the most part, the company can process and fulfill all orders within 24 hours at the plant, which became fully operational this past April.

Efficient warehousing and dispatch is critical for us. We wanted a system that would allow us continuous throughput of product, while making maximum use of space and available warehouse personnel," says Ray Shipton, operations director at EEO. "For us, the chief benefit of this system is the lack of mechanical brakes."

High-lift fork trucks are used to load the Loadbank system from an accumulation conveyor across an aisle. Loads are then **automatically** moved first-in/first-out, 16 metres to loading docks. The loads are picked directly from the Loadbank system, and loaded onto highway trucks for delivery to customers. More specifically, **pallets** move through the system using rollers and a cushion of air.

Pneumatic hose is incorporated into the system's gravity conveyor. When air is introduced into the hose, wheels are raised to allow loads to move safely down the track. Because the load can't move when there's no air in the hose, no brakes are required. As soon as the air is withdrawn, the load settles onto the brake surface. The timing of air pulses into the hoses is set to move loads a predetermined distance on each activation, depending upon load stability.

Speeds are adjustable from fast to a gentle creep. The slope of the unit is standard for all installations, and weights up to 6,000 pounds can be handled. The system is also operated by radio frequency cordless control devices from Cattron Inc.'s UK subsidiary. This equipment allows the system to be activated by lift truck operators from their cabs, as they prepare to place or pick another load. Each of the 24 bays in EEO's storage area is controlled individually by the cordless controls, allowing several of the bays to be handled at the same time.

Remaining on the other side of the ocean, a major UK retailer is applying Buckhorn Inc. reusable BinBox containers in its new distribution centre. Prior to phasing BinBox in early 1995, the retailer had used Buckhorn's 21-by-15-by-12-inch attached-lid containers for outbound shipments of merchandise to stores. Product lines include apparel, hardware, housewares, records/tapes, health and beauty care, books, and general household items.

More than 60 percent of the retailer's suppliers now ship to the distribution centre in BinBoxes, with the goal to convert up to 100 percent over the next several months. The typical supplier loads containers by hand, storing them in shelving until needed by the retailer. At this stage in the warehouse or in transit, the BinBoxes can be secured with plastic

ties/rivets for extra spill and theft protection. Dollies/**automated** systems may be used to get the containers out to the supplier's dock, where they're loaded onto trucks.

On return shipment of empties from the retailer, no set up is necessary. Empty Bin Boxes are returned to suppliers in a "nested-and-ready-to-be-filled" position, in which the lids are open and the gates down. The supplier's personnel merely pick an empty from the nested **stack,** fold the gate up, load the box, close the lids, and return it to the shelving for outbound shipment. Product going into the BinBox containers is determined by the rate of turns at the store level. The retailer makes these determinations in conjunction with each supplier.

Generally, if a product is ready to go into the "eaches" area at the distribution centre, it's placed in a BinBox by the supplier. Off-loaded shipments of full BinBoxes from suppliers are **stacked** five per layer on 48-by-40-inch **pallets.** Containers are then moved into the "goods in" area, via **pallet** by forklift or **pallet** jack. They're checked in and sent directly to the eaches area, as needed by the stock replenishment team. There, shipments are broken down from bulk, repacked into BinBoxes, and then sent to the eaches area.

At the eaches area, the gravity-flow picking racks are filled from behind. The quarter-half lid is folded back and the gate opened, when the BinBox is loaded into the pick rack. Pickers fill store orders, placing them into 21-by-15-by-12-inch reusable containers for outbound shipment to retailers. If necessary, the picker can also apply an individual price **identification** label to the products. Once emptied, the picker removes the BinBox from the pick face and the next one slides into position.

Overhead, the empty container is placed in a takeaway rack, gate side last. Someone else removes the empty containers from the rack, opens the lids, nests the containers, and sends them back to the staging area via a takeaway conveyor, where they're returned to suppliers for refilling and reuse. Theoretically, if full case quantities are required by the store, the distribution centre could receive full BinBoxes and send them directly out with repacking. At this point, however, the retailer has no plans to do so.

JOURNAL-CODE: 0107

LOAD-DATE: July 08, 1999

3RD STORY of Focus printed in FULL format.

HEADLINE: AS RS serves the flexible manufacturing cell; automatic storage and retrieval system

BYLINE: Dobbins, Donald B.

BODY:
  AS/RS serves the flexible manufacturing cell Webb-Triax Co's J J (Jack) Craddock, reports, "What we're seeing is progressive manufacturing supported by islands of in-process storage. Typically, this is controlled by a host computer with MRP, and an inventory-management system running on a PC or mini-computer as required."

  Tools and dies are just some of the many items that are benefiting from point-of-use storage. Tools, raw materials, and work-in-process can be stored on the factory floor, either between or adjacent to flexible manufacturing cells. In one particular cutting-tool-storage system, tools for untended, automatic machining centers are put together at workstations adjacent to an automatic storage and retrieval system (AS/RS) tool-inventory area. Workers assemble toolsets and preset the tools according to a need schedule determined by a host computer. When finished, tools are transported to a finished-tool-storage area, another AS/RS, where they await transfer, via AGV, to the final machine-tool use area.

  Why an AS/RS?

  There are a number of reasons why a given manufacturing operation might benefit from an AS/RS to store in-process inventory in the production area. One of these is that the user might want to store parts for a longer time than would be practical with a pallet- or tote-box-on-the-floor method. Or, there might be parts that are hard to awkward. Primary reasons to adopt an AS/RS might include a desire to reduce floor space devoted to raw material and in-process inventory storage, reduce the cost of in-process inventory, and get material as close to the work area as practical.

  AS/RS systems generally keep track of in-process inventory by part number with pallets, racks, boxes, etc being stored randomly. Even random storage, however, will be controlled so that material is stored somewhere near the next point of use. For example, in a multicell operation, raw material would be stored close to cell number one; the partially completed parts from cell one would be stored in a random location convenient to cell number two; and so on.

As a rule of thumb, the typical user might want to store about two day's worth of raw material.

What's important in determining the size and type of any system is throughput needed. Some form of inventory management is required. Material is delivered into and out of the cell based on a master production schedule. You can get all the sophistication you want or make the system as simple as you want. How many computers you have, where they are located, and what they do depends on what state of sophistication you desire.

Defining the system

According to Craddock, you have to begin with a basic understanding of what an AS/RS is and what it does. Then the level of sophistication is determined by what you want to get done. One of the better ways to go about this is to talk to people in the industry. Tell them what you need to get done. They can tell you pretty quickly whether it will work or not.

AS/RS consist of storage modules --generally steel storage racks; a storage retrieval (S/R) machine--it runs on a rail and is PLC controlled; and peripheral equipment--which might include AGVs, conveyors, bar code scanners, (all PLC controlled) and a computer system to drive the AS/RS system.

Cost is a big factor; but, determining a ballpark figure is tricky because an AS/RS system can be very simple or very sophisticated. The inventory-control package (software) might run about $ 100,000. A modest system to handle small loads could run as little as $ 300,000 to $ 350,000. A large, heavy-duty system can go as high as $ 750,000 per aisle.

Things you need to know to begin to size or select an AS/RS system include the following:

Load footprint--size--the user needs to describe the **pallet** width, length, height, weight.

System size--how many **pallets** do you need to store at one time?

Traffic--how often do you want to move a **pallet** into and out of the system? Will there be full loads in and out once, or partial loads in and out a **number** of times?

Location--can the system be installed in an existing building, or must a new building be constructed? What is the available height in the present location? Is there room for a new building near the point of storage need? For example, if the height of the existing space is 15 ft, an AS/RS might not be practical because you may be able to stack only three high; whereas a new building with an 80-ft height would be much more cost effective.

General capabilities

An automated storage and retrieval system, of appropriate size and design, operating under computer management, should provide the following benefits: * Make storage an integral part of your manufacturing or distribution process. * Help bring inventory down to just-in-time levels. * Provide better access to

work in process, and allow small parts to be stored at point of use for immediate and accurate retrieval. * Retrieve from storage selectively by category, such as age, part number, size, or style. * Reduce inventory error to near zero by use of computerized, real-time inventory management. * Improve management functions served, such as sales, customer service, shipping, and expediting. * Make the most cost-effective use of plant or warehouse floor space.

Load classifications

Automatic storage and retrieval systems are classified by Webb-Triax as unit-load, mini-load, and micro-load systems.

Unit-load systems comprised the early AS/RS machines. Demand for these large systems has tended to decrease as newer manufacturing systems have become more important. Nevertheless, they are still applicable in some areas. These include warehousing and distribution facilities as well as manufacturing operations where extremely heavy loads must be handled. The Webb-Triax Unit Load Retriever has a load capacity of up to 10,000 lb.

Mini-load systems are much smaller than unit-load systems. They are designed to store and retrieve parts weighing between 100 lb and 1000 lb. These systems are well suited to meet the needs of component, subassembly, kitting, and work-in-process storage for modern automated factory operations. Materials are usually stored in coded trays or drawers in a rack structure.

Micro-load systems provide storage and retrieval of small parts (less than 200 lb). They are designed to handle fragile or sensitive products. Parts are stored in plastic bins or tote boxes in an enclosed rack structure.

Reasons for using an AS/RS

There are many reasons why you might want to consider installing an AS/RS in your manufacturing area. These include:

Space savings * Consolidates storage and releases existing space for manufacturing * Eliminates new construction and inherent disruption costs * Uses "air rights" to minimize floor area

Direct labor savings * Performs complete storage operations and record keeping with realtime control and inventory-management systems * Reduces the number of operators performing existing material-handling functions * Utilizes manpower more efficiently

Indirect labor savings * Support manufacturing resource programs * Provides Just-In-Time delivery * Supports quality-control procedures * Supports quarantine procedures * Reduces supervisory time * Allows faster audits with cycle counting * Improves housekeeping * Lessens operator fatigue; heightens morale

Improved in-plant service * Consolidates movements to and from storage area * Reduces setup time * Reduces production downtime and increases quality of work * Helps prevent defective material from entering production line * Ensures accurate inventory control to support MRP

Improved customer service * Provides for more efficient scheduling * Enables faster shipment * Improves inventory mix * Simplifies expediting

Indirect expenditure savings * Reduces amount of existing material-handling equipment * Reduces maintenance costs compared to conventional equipment * Reduces investment in inventory * Reduces carrier delay * Reduces or eliminates material damage * Reduces lighting and heating requirements

Lower insurance rates * Increases safety to the material handled * Improves housekeeping

Improved tax situation * Reduces inventory * AS/RS equipment is treated as capital equipment

The relatively low cost of computers and programmable controllers makes it practical to use specialized controllers for conveyors, AS/R vehicles, and AGVs. This is distributed control, the most important concept in today's control-system technology.

PHOTO : 1. Integrating a computer-based AS/RS with other material-handling equipment efficiently

PHOTO : provides parts where and when needed. This manufacturer transports rubber products from

PHOTO : work-in-process storage through processing and shipping using three aisles of AS/RS, nine

PHOTO : automatic guided vehicles, and a roller conveyor system. Uptime for the system has been

PHOTO : 99.2 percent.

PHOTO : 2. IBM's manufacturing plant in Lexington, KY, is one of the world's largest automated

PHOTO : factories. It cost IBM $ 350 million to convert its Selectric Typewriter facility into a

PHOTO : completely computer-integrated manufacturing system for building Proprinters, Quietwriter

PHOTO : typewriters, keyboards, and related equipment.

PHOTO : The plant has three major automated systems: 200 robot workstations for assembly

PHOTO : operations; an automated material-handling system with over seven miles of conveyors for

PHOTO : transporting parts, components, and products; and an automated part-retrieval system,

PHOTO : which ensures that parts arrive at workstations when needed. In addition to the robot

PHOTO : workstations, there are more than 50 manual cabling and rework stations.

PHOTO : Material-handling equipment includes automatic storage and retrieval systems, automatic

PHOTO : guided vehicles, and a series of overhead and inverted power-and-free conveyors that move

PHOTO : products and components through the manufacturing process. Supplied by Webb-Triax Co,

PHOTO : Cleveland, OH, a Subsidiary of Jervis B Webb Co, Farmington, MI, this AS/RS stores and

PHOTO : retrieves parts, components, and partially assembled products.

PHOTO : 3. General Dynamics recently installed an automated **sheet-metal** fabrication line, which

PHOTO : includes this 60-compartment AS/RS supplied by Webb-Triax Co, Cleveland, OH. The AS/RS

PHOTO : stores, retrieves, and feeds aluminum sheets as large as 144" x 48" in stacks up to 10"

PHOTO : high. The retriever, which can store and retrieve 7500-lb stacks of **sheet metal** at a rate

PHOTO : of 20 **pallets**/hr, is serviced by an input and output conveyor consisting of a two-deck

PHOTO : chain conveyor supplied by Webb-Norfolk Conveyor, Cohasset, MA.

PHOTO : A computer directs the machine to deposit **pallet** loads of sheet in a specific location

PHOTO : in the AS/RS and automatically records the location. When needed on the fabrication line,

PHOTO : the computer instructs the AS/RS to deliver a **number** of sheets to the vacuum sheet loader.

PHOTO : After the loader tests and stacks the sheets, the system sends the metal to a CNC

PHOTO : drill-router via a car-on-track conveyor. The AS/RS returns unused sheets to storage. When

PHOTO : stock from a particular slot is exhausted, the system places the

empty skid on the output

PHOTO : chain conveyor for removal.

PHOTO : 4. Kitting storage consists of gathering parts required to assemble a particular item

PHOTO : and placing them in a package. In a typical application, a mini-load system receives

PHOTO : tools, inventories them by family type, and stores them as sets for specific machines.

PHOTO : They are withdrawn and sent to machining centers as needed.

PHOTO : The mini-load AS/RS was selected because of the size and weight of products handled.

PHOTO : It uses customized trays similar to those used for storing tools in drawers. An integrated

PHOTO : conveyor services adjacent work stations.

GRAPHIC: Photograph

SIC: 3569 General industrial machinery, not elsewhere classified

IAC-NUMBER: IAC 07817213

IAC-CLASS: Trade & Industry

LOAD-DATE: August 04, 1995

17TH STORY of Level 1 printed in FULL format.

HEADLINE: Tall order: new equipment makes inventory picking easier

BYLINE: Robertson, Robert

BODY:
   Fast and effective order picking must be the goal of your company. The cost of an inefficient supply chain is a heavy price to pay. Today, customers demand correct and on-time product orders. They won't accept anything less. To help you get the job done, a vast array of order picking equipment is available. It's a broad sector of the market, with products ranging from high-reach trucks to plastic totes to paperless systems.

   According to Crown Equipment Corp., productivity breakthroughs on its RR 5000 series reach trucks start with the work-relief centre, where operator comfort has been enhanced in a variety of ways. Features such as padded surfaces, a suspended floor-board and thermal management work together to eliminate discomfort and fatigue. Padded supports are effectively positioned for the back, arm/elbow, knee and hip.

   The company says the RR 5000 series also offers increased operator performance. An optional productivity package **automatically** adjusts travel or lowers speeds based on the weight of the load. Electronic-variable braking adjusts, depending on the height of the load being carried. By combining lift/lower speeds, traction speed and acceleration, an operator can save up to 38 minutes during an eight-hour shift.

   Use of the RR 5000 series has been further simplified with interactive display and multi-task control. The interactive display provides custom profiling, visual feedback of truck operation and extensive service/diagnostic capabilities. An optional capacity-data monitor gives instant feedback on actual load-to-truck capacity rating. Operator entry and exit is also enhanced with a floor height of 9.4 inches.

   Rapistan Systems has developed a range of radio frequency (RF) pick carts suitable for paperless fulfillment of split-case and small parts/products, where there's a high **number** of SKUs (stock-keeping units) with relatively low pick rates. During a single pass of the warehouse, the PickCART enables batch-style picking of multiple orders that helps boost productivity. A separate tote is used for each order to be picked.

Operators are directed to the next picking location by the RF terminal's large onboard screen. The on-board scanner allows the location and/or product to be scanned by the operator and confirmed in ''real time.'' RapidPICK slot displays on the PickCART **identify** the totes into which the picked items are to be placed. The company also offers an array of other products, including conveyors and **automated** storage and retrieval systems (AS/RS).

Diamond Phoenix says its horizontal carousels offer advanced features that include a free-standing triple-tier design system reaching over 50 feet, full utilization of off-the-shelf components and a per-bin capacity (2,000 plus) that maximizes the carousel's storage capabilities. According to the company, these advancements provide increased retrieval speeds and maximized productivity, flexibility and ease-of-use.

From Caterpillar Lift Trucks comes its 3,000-pound model NRP30 walkie-**stacker** reach truck. The company says the truck offers a new, ergonomically designed control handle and proven components from other Cat narrow-aisle products. The multi-function handle puts all controls -- direction, travel speed, braking, lifting, lowering, reaching and retracting -- within the operator's reach.

The company says all hydraulic functions on this Cat walkie-**stacker** reach truck are conveniently located on the control handle. The triplex mast offers two lifting heights, either 152 or 189 inches, with auxiliary hydraulics routed inside the mast. The standard 24-volt transistor electrical-control system promotes long battery life by using power efficiently. With a vertically mounted motor, heat also dissipates evenly.

EASYpick DMS from Real Time Solutions offers the benefits of client/server computing and easy-to-learn graphical user interface with Windows. It has the open architecture of an Informix database employing Structured Query Language (SQL).

EASYpick DMS runs on UNIX-based processors, such as Hewlett-Packard 9000 servers, employs X terminals and supports a wide variety of RF terminal vendors, EASYpick DMS **identifies** and compares receipts to what's expected and updates inventory records immediately. As a result, needed products and odd units can be directed to forward locations instead of to reserve locations.

According to the company, RF operators can easily handle unexpected receipts and customer returns can be **automatically** quarantined for quality assurance. According to Penco Products Inc., its Clipper Industrial Storage Systems offer the strength of high-performance shelves, ease-of-assembly, and the versatility of multi-level and high-rise applications. Available in a variety of sizes, the shelves feature a rigid, roll-formed, welded, box-beam shape in the front and rear flanges. Shelf capacities of up to 2,000 pounds are possible.

Yale Materials Handling Corp.'s narrow-aisle NTA operator-up turret trucks are available in 3,000- and 4,000-pound lift capacities. The trucks provide lift heights of over 40 feet, work in aisles as narrow as 66

inches, can be rail or wire-guided and handle a variety of loads. The operator's compartment is designed for stand-up or sit-down operation. The company says the ergonomic workstation allows for more operator time in the truck, resulting in more loads per work cycle.

The operator console allows for both vertical and horizontal adjustment, providing the operator with exceptional comfort, the company reports. The operator sits or stands in the centre, facing forward, for a clear view during operation. Order picking can be performed with the seat in the ''up'' position and controls adjust to accommodate a wider range of motion. The forks smoothly raise, lower, pivot and traverse on an auxiliary mast and heavy-duty carriage.

White Systems Inc. says its vertical Lighttee III and horizontal Sortbar III light-directed picking systems enhance productivity and accuracy, while providing advanced levels of flexibility and ease-of-use. Custom-alphanumeric messages and the application of colour help speed operator response time and increase accuracy. Yellow arrows indicate the active carousel and shelf level. Green indicates the cell, and red the quantity.

According to the company, infinitely adjustable modules clip onto the Lightree or Sortbar housings to conform to any configuration of shelves and bins. The Lightree is positioned to the side of the picking point of a horizontal carousel. Software-controlled LEDs illuminate and direct the user to the proper carousel bin. The yellow indicators, aligned inches away from the bin, point to the exact shelf location.

The alphanumeric LEDs identify the correct cell number in green, and the task (pick, put or custom direction) and quantity in red. In batch order picking applications, the Sortbar is positioned above or below the totes into which picked materials are placed. A dimensional red light illuminates to show an active tote's location. The LEDs will indicate the cell within the tote in green, and the quantity of items the operator should place in red.

In other news, Tacoma, WA-based West Coast Groceries is using eight White horizontal carousels with two lift tables, lighttees and sortbars. Since implementation, West Coast has increased throughput by 174 percent. Previously, workers were able to pick only 102 health- and beauty-aid items per hour. Items stored in the carousels are now picked at a rate of 280 per hour each line averaging six items.

With the old system of static shelving and flow racks, West Coast stored 1,600 items in 6,000 square feet. But the eight White carousels allow West Coast to store 3,200 product items in only 2,400 square feet. ''Besides increasing productivity, we've been able to expand our product line. We now stock twice as many SKUs in less than half the space,'' says John Herbertson, West Coast's inventory manager.

The eight carousels are divided into two pods of four -- each with a lift table, a lightree and sortbar. The carousels have 50 bins that measure 21 inches wide by 22 inches deep and 10 feet high. The carousels are also located 10 inches apart. All high-value items are located in the inner

carousels, limiting access to the more valuable stock. Outer carousels house high-volume items, allowing for faster replenishment.

The lightrees and sortbars allow for paperless batch picking -- up to eight orders, each for a different store, at one time. The day and second shifts each have two people picking off the carousels. Collectively, the four

workers pick 15,000 lines per week. The computer divides the carousels into upper and lower zones. While the computer is sorting the orders into batches, it also divides the picks into upper and lower zones.

The operator will start picking the upper zone, then lowers the lift platform to floor level to pick the lower zone. Picking proceeds from one carousel to another. As soon as the operator hits a ''task complete'' button that indicates all required items have been picked from a location, the carousel **automatically** rotates to the next item. By the time the operator finishes picking from other carousels, the original carousel is back in position.

As product orders are pulled, the tote is sealed and tagged with store **identification.** Via a conveyor, the tote is sent to the shipping department for consolidation with bulk items. Using a report generated by the software, replenishment occurs during the third shift. The report tells which items have low-stocking levels. ''Since we added the lightrees and sortbars, errors in items pulled and quantity have nearly disappeared,'' says Herbertson.

Buckhorn Canada introduces its 48- x 45-inch medium-duty collapsible Bulk Box. The new container is ideal for manufacturing applications requiring weight capacities of 1,800 pounds or less. They include shipping and handling plastic parts, wiring harnesses, powders and resins. According to the company, key features of the Bulk Box are:

- One centre steel and four perimeter plastic runners to provide compatibility. with competitive bulk containers.

- Semi-open base to allow for easy cleaning.

- Optional accessories such as a corrugated plastic sheet to line the base of the container, and **identification** systems such as cardholders or **ID** tags.

- Available in 34-inch height, the container optimizes trailer cube to reduce transport costs.

Raymond Gofer order pickers, which are available from G.N. Johnston Equipment elevate the operator with a load up to 15 feet. According to the company, this eliminates the problems of reaching slots above the first shelf level encountered by operators of powered walkie trucks. The company says order picking from floor, first and second rack levels is easier and more efficient with a Gofer. Operators don't have to stretch/climb up stock or pick the second shelf level.

Gofer order pickers are available with options, including cold-storage

conditioning and an auxiliary mast that can position the load at a comfortable height for the operator. With the auxiliary-mast option, the operator's control panel can be positioned either at the front or back of the driver compartment, allowing for easy load-first travel. Power steering (standard), adjustable height-control panel, contoured control handle and folding seat/lean pad with auxiliary mast option are other features.

Radio Beacon V 2.1 is now available from Data Technology Software Integration Ltd. Created for wholesale distributors, V 2.1 is designed to reengineer a warehouse for maximum productivity and retail compliance, eliminate errors and reduce costs. It incorporates the use of RF handhelds, bar coding and a pick-pack-and-ship software package. These include fill-rate management, random-directed putaway, and support for carousel hardware and price ticketing.

''Earlier versions of Radio Beacon focused on getting the right product into the right carton with the right label,'' says Tom Berend, director of technical services for Data Technology. ''This was basic productivity, compliance and accuracy issues for material handlers at the warehouse level. The new version includes all of those capabilities, plus tools for proactive management of warehouse material flow.''

Atlet Materials Handling Equipment says its LS pedestrian **stacker** allows cost-conscious companies with space restraint to safely and quickly transport materials or finished goods. The LS **stacker** lifts 3,000-pound loads up to 15 feet and can be used where space is at a premium -- narrow-aisle storage, etc. Its low mast with full-free lift permits the **stacker** to be driven into all types of delivery trucks, on dock levelers and through low doorways.

The optional flip-down platform enables operators to walk or ride as required for maximum productivity levels, the company says. Base-leg lift increases under clearance, with the LS becoming a combination electric **pallet** truck and **stacker.** The LS base-leg lift can handle stringer-designed **pallets** and the forks can **stack** any type of block-designed **pallet.** skid or wire basket.

Jervis B. Webb Company's AS/RS are built around racks, **pallets,** containers and machines that are specifically designed to fit users' products and processes. According to the company, AS/RS can deliver parts for kitting and subassemblies with speed, accuracy and efficiency. The company says they provide crucial buffer storage in just-in-time operations, offer quick access to work-in-progress, and allow secured and protected storage of sensitive materials.

Systems for virtually any load size are also available. Micro retrievers are suited for small, sensitive or fragile loads under 250 pounds. Mini retrievers can accommodate loads up to 1,000 pounds unit-load retrievers handle high-rise storage of loads up to 25,000 pounds. Any standard programmable logic controller (PLC) -- including units already in use at a warehouse can provide system control.

From BT Canada Ltd. comes its range of Reflex reach trucks that are powered

by AC motors. Aimed at the heavy-duty end of the market, the trucks offer 5,500-pound capacities, with lift heights to about 35 feet (model references B/E 7-8).

According to the company, benefits of the trucks include:

- Acceleration doubled compared to DC trucks.

- Top speed increased by about 10 percent, and fully achievable with or without load.

- Reduced service costs due to the elimination of brake wear and need to replace carbon bushes in the motors.

Made from structural foam-molded, high-density polyethylene, Cookson Plastic Molding Corp.'s block-style Boss **pallet** measures 40 x 48 x 5 11/16 inches and weighs approximately 57 pounds. It's designed with an edge-rack load capacity of 2,800 pounds and a dynamic load capacity of 5,000 pounds. According to the company, Boss **pallets** have been successfully tested on conveyors, AS/RS and racking systems.

Information on order picking equipment in this article is available by writing the following **numbers** on the reader service card facing page 100:Crown 325

Rapistan Systems	326	
Diamond Phoenix		327
Caterpillar	328	
Real Time Solutions	329	
Penco	330	
Yale	331	
White Systems	332	
Buckhorn Canada	333	
G.N. Johnston Equipment	334	
Data Technology	335	
Atlet336		
Jervis B. Webb	337	
BT Canada	338	
Cookson	339	

JOURNAL-CODE: 0107

LOAD-DATE: July 01, 1999

. .

25TH STORY of Level 1 printed in FULL format.

March 15, 1998

SECTION: Pg. 134

LENGTH: 2267 words

HEADLINE: I wish . . . Building the perfect warehouse

BYLINE: BY HALLIE FORCINIO

HIGHLIGHT:
The "perfect" beverage warehouse is built with some pretty basic tools.

BODY:
   In many beverage warehouses things are done the way they've always been done
-- manually. One reason is because beverage warehouse managers tend to be a
conservative lot. In addition, "Total automation doesn't make sense below a
certain volume," explains Peter Cameron Jr., vice president of operations at
Cameron Coca-Cola (Washington, PA).

   Nevertheless, interest in warehouse automation is growing and a few beverage
facilities -- especially those with the highest volumes -- now boast
state-of-the-art automation.

   Whatever the level, in every facility there's at least one area managers
would like to improve -- by installing new equipment, an advanced management
system, physical improvements or a more efficient logistics process. Let's snap
a few wishbones and build a wish list.

I wish . . .

Get a grip: Tygard Claw

   At the top of many wish lists is a Tygard Claw from Tygard Machine &
Manufacturing Co. (Washington, PA). Especially designed to automate layer
picking for mixed-load pallets, it's a four-way layer-lifting and
pallet-splitting device capable of handling single or multiple layers of canned
or bottled product.

   The Claw's pressure-sensing rubber-faced pads surround, gently lift and place
layers at speeds 10 times faster than can be done manually. Available in two
models, the Tygard Claw is either mounted in place of forklift tines or
side-mounted on a lift truck that runs between guide rails.

   Custom-built to suit specific pallet footprint dimensions and number of
layers in a load, the Claw's cost will run about $ 25,000 for the largest unit
-- plus the cost of the forklift. Most customers supply a forklift from their
existing fleet or buy a new one and have it delivered to Tygard for installation
of the Claw.

The Claw has been enthusiastically received by beverage warehouse managers because it reduces labor requirements and lowers back injuries. "Eliminating handling by hand has a major impact on worker's compensation expenses," explains Jim Wilhide, general manager at Tygard.

With a Tygard Claw, one person can accomplish in an hour what formerly took six people. The goal is to "get as much productivity out of as little space as possible," says Wilhide.

I wish . . .

It's automatic: Automated guided vehicle (AGV)

Another material handler many warehouse managers would like to install is an **automated** guided vehicle (AGV) system to cut forklift traffic. For example, one forklift plus three AGV carts running in a loop path could unload a 24-**pallet** truck in six trips, a 75-percent reduction compared to forklifts alone.

AGVs are becoming simpler to install, especially in existing facilities. Instead of wired paths embedded in the floor, newer units use non-wire guidance systems, which rely on an onboard positioning computer and laser sensor working with reflective tape mounted on walls and other objects along the route.

Changing a route with such an AGV is simply a matter of rearranging the reflective markers and teaching the unit the new way by driving it and recording the information in the computer. Pickup and delivery instructions are received from a stationary dispatch computer via infrared (IR) or radio frequency (RF) communication.

I wish . . .

We're swinging: Automated truck loader

Other wish list items include an **automated** truck loader. "This would be a swing arm on a trolley or conveyor system that picks up **pallets automatically,**" envisions Bill Ruiz, director of operations at A-B distributor Mockler Beverage Co. (Baton Rouge, LA).

I wish . . .

Rack'em up, all sorts

Racking scored high with several bottlers and distributors. "We're putting some racks in now," reports James Scott Bridgeforth, vice president at Royal Crown Bottling Co. of Winchester [VA].

Mockler's Ruiz would like to see an **automated** rotation rack system, capable of handling high volumes.

"I'd like more push-back racking," describes Marino E. Brailas, warehouse manager at Great Plains Coca-Cola (Oklahoma City, OK). "It's a big help for saving space and for products like bag-in-box, which can't be **stacked.**"

I wish . . .

Hold tight: Shrinkwrap

Adding shrinkwrap machines to **automate** wrapping is under consideration at Coast Distributing, an A-B house in San Diego, CA, reports its warehouse manager Mel Jones. The machines would not only improve productivity, but also eliminate the repetitive bending and stretching involved in hand wrapping **pallets.**

I wish . . .

It's in the details: Drains and powerpoints

For those fortunate enough to be building a new facility, attention to the right details today will ensure its future flexibility and efficiency.

"It's the little things you forget that get you," explains Cameron, who went through the design and construction process about five years ago.

Of seemingly mundane details like floor drains and electrical outlets, Cameron insists, "You can't have too many of either. It's always more expensive" to add them later rather than install them to begin with.

Cameron also advises adding extra space for recycling functions.

I wish . . .

When you build, size ahead

In planning for growth, the challenge is "knowing where the business is going to be five to 10 years down the road," says Walker Spann, vice president of operations at A-B house Pearlstine Distributors (Charleston, SC). "If you overbuild, ROI won't be good enough, yet if you underbuild, then you have logistical problems where you have to double- or triple-handle. That's not efficient," he adds.

Ideally, the chosen site should be large enough to accommodate an addition -- and the design should allow a building project to proceed without interrupting the normal routine of the existing facility.

I wish . . .

Docks adjacent and adjustable

Other "perfect" building features include positioning receiving and shipping docks adjacent to one another to maximize vehicle utilization.

Docks should have electric levelers to compensate for differences in trailer and dock heights. Electric units are easier to use than manual and more dependable, according to Brailas at Great Plains Coca-Cola.

I wish . . .

Temperature tattletale

For temperature-controlled areas, a centralized control panel is an advantage, particularly if it includes audible and visible alarms to alert operators, should conditions drift off-spec.

I wish . . .

Warehouse management system: Where'd I put that?

The greatest challenges in a manual warehouse include:
a) deciding where to put product
b) remembering where it's at
c) knowing how long it's been there, and
d) recording when and where it ships.

A warehouse management system to track all those details is another top item on the perfect warehouse wish list.

Such a setup would include a locator system, which tracks product **code** and fill date, so when a row of product is depleted, the forklift operator can call up the next appropriate location instead of driving around looking for it. This typically is done using a vehicle-mounted computer terminal that communicates with a central computer via RF and uses a **barcode** scanner to capture location and product information. The system also can interface with **palletizers** to determine the best spot to put a load.

A first-in/first-out (FIFO) rotation should be established, along with a floor layout that always positions the oldest product in front. "The goal is to minimize product that goes out of date," says Dan Trew, product manager at warehouse management system-builder Catalyst International Inc. (Milwaukee, WI).

To assist in that effort, the system should flag product with approaching expiration dates so everything possible can be done to move it out the door. Extending this capability, it's also possible to track incubation periods for certain products -- and **automatically** release it as soon as it is available for shipping.

I wish . . .

Warehouse management system: EDI and more

Another popular warehouse management system function is electronic data interchange (EDI), which records what's in each outgoing shipment and enables the warehouse to generate and electronically transmit advance shipping notices to customers. Working in reverse, customers can use the system to notify the warehouse about incoming empties.

Going a step beyond EDI, most systems also can record and store data about shipments so the company can quickly **identify** where product with specific lot **numbers or code** dates was shipped, should the unthinkable happen and a recall become necessary.

While initial requirements for a beverage warehouse management system tend to be relatively modest, most programs are quite robust and can offer a variety of additional capabilities -- sometimes in the form of add-on modules.

Full-featured software like the Catalyst Warehouse Management System being installed by Molson Breweries at two distribution centers (Etobicoke and Barrie, Ontario) also provides additional functions like **stackability** analysis, which tracks that **pallets** are not **stacked** too high for the product or physical location.

Molson chose the Catalyst system to support its commitment to freshness and quality. "The Catalyst system will help to ensure precise lot control and will assist in proper product rotation," says John Aitken, vice president, distribution and logistics at Molson, North America's oldest brewery.

Yet another potential task, interleaving, ensures maximum vehicle utilization by increasing the time there's product on the tines of the forklifts. This is done, for example, by instructing an operator who has just put away a **pallet** and is heading back to the receiving dock to pick up a load that can be delivered on the way.

I wish . . .

Pick-and-plot: Truck-loading software

One of the most labor-intensive operations in a beverage warehouse is loading route trucks. Today, software programs like Ultimate Load Manager (ULM) from Norbond Inc. (Library, PA) can build day-specific loads tailored to each truck and route.

Norbond's ULM software generates pick lists taking into account warehouse layout and produces load map diagrams and load reports. Organizing loads minimizes the time the driver spends digging and restacking product and maximizes customer service time. It also arranges product to minimize tilting and tipping, thus reducing damage.

For drivers responsible for route sales, a Planned Overload option determines the optimum overload for each truck based on season, route, package type and sales history. In addition, returned product is recognized as "pre-loaded" to minimize restocking and picking labor.

Payback for the $ 22,000 system reportedly is within a six- to 16-month timeframe. Customized according to site-specific needs, the software can be compatible with robotic layer handling or units like the Tygard Claw, and interfaces with forklift-mounted displays and warehouse management and accounting systems.

I wish . . .

The simple life: One **pallet** for all

Many beverage warehouse managers yearn for a simpler life. Gerald Spehar, president of beer wholesaler Rohlfing Inc. (Duluth, MN), would like to see the industry standardize on a single **pallet** size. He'd also like to see Sankey tap systems on all kegs. "It's a lot of work" to switch tavern heads back and forth, he says.

I wish . . .

No rest: Line loading

   Although a completely **automated** warehouse is at least 10 years away, the
trend is decidedly moving toward more **automation** and fewer people.

   Going along with that theme is an increasing emphasis on line loading. That
way there's no double-handling and inventory levels are reduced, as well. Empty
bottles are unloaded from an incoming trailer, taken to the line, filled,
palletized and loaded onto an outbound trailer.

   Finally, many warehouse-watchers predict the logistics of distribution will
integrate itself more and more seamlessly into the full supply -- and sales --
chain. Mark Wheless, EVP of worldwide operations for Pepsi, dubs it
"integration with sales," and describes it as "where the plant manager is as
concerned with the sales forecast as he is with his production schedule."

Space: The final frontier

   Warehouse and distribution space costs money. But there's a fine line
between having too much space and not enough. These questions may help you
carve a warehouse that's right-sized.

Inventory philosophy

   How much supplies and materials are stored and how many days supply of full
goods is kept on hand? The typical five- to seven-day supply has dropped to 1-2
days in today's just-in-time environment.

Stacking height

   How high do you plan to **stack** full **pallets?**

Stacking arrangement

   Will **pallets** be floor-**stacked** or arranged in racks?

In-house production

   A warehouse connected to a production facility needs space for a
drive-through area for route trucks. In colder climates, this space must be
large enough to allow in-house overnight storage to prevent product on loaded
trucks from freezing.

Package proliferation

   How many different products and packaging styles do you handle? If your
customers want mixed **pallets,** then a **pallet** makeup area is needed.

Returnables

   If your market mix includes returnables, space needs to be allocated for
incoming staging -- for their inspection and preparation for reuse or recycling.

Method of distribution

Whether product goes out on a conventional, pre-sell or bulk route influences the amount of space needed for **pallet** makeup and drive-through space.

LOAD-DATE: April 6, 1998

46TH STORY of Level 1 printed in FULL format.

HEADLINE: The growth of a warehouse

HIGHLIGHT:
Konings' new warehouse employs a real-time warehouse stock management system
that incorporates **barcode** scanning terminals to record stock movement

BODY:
Konings (Zonhoven, Belgium), one of the leading manufacturers of alcoholic
and non-alcoholic drinks in Benelux, wanted to implement a software system that
would enable more effective management of stock. For this purpose, the company
decided to implement a real-time warehouse stock management system using
portable, radio frequency (RF) **barcode** scanning terminals (radio data terminals
[RDTs]) to record stock movement. Because Census Computer Services (Walsall, UK)
used the same programming language as Konings and had experience with
automated warehouse management, it was chosen to integrate the Warehouse
Management Software into Konings' existing computer system. With regards to
benefits, the system locates space to store goods and finds them again when
shipping them out. Stocktaking is improved and can be done on site by blocking a
location for counting and confirming stock against its **computerized** location
record. Furthermore, maximum storage capacity can be utilized when tidying
wasted space in partially picked FIFO (first in, first out) island locations and
from using mixed storage in high-rise **stacks.**

Konings (Zonhoven, Belgium) is one of the leading manufacturers of alcoholic
and non-alcoholic drinks in Benelux.

Growing pains

Due to the rise in production from the growing diversity of drinks in recent
years, the company found its current warehouse lacking in space to cope with the
demand.

However, there were not many alternatives to solve this problem. Building
on-site rooms systematically was an expensive option. "On average, each two
years, a new store room was built on site. Each time it was concluded, after one
year, the room was full to bursting again and we were forced to pull out the
construction plans for a future warehouse expansion. It was almost like fighting
a losing battle," says Jacques Hendrikx, production manager at Konings.

To combat the storage problem, Konings built another warehouse a few hundred metres from its centralized production facility.

"We wanted absolute control over the warehouse. The importation of modern management techniques, for hardware and software, had to bring it about," says Patrick Hermans, electronic data processing manager, Konings.

The software solution

Konings wanted to implement a software system that would enable more effective management of stock. The company sought a software house to develop the management software on its behalf. Census Computer Services (Walsall, UK) used the same programming language as Konings and had experience of **automated** warehouse management, and was, therefore, chosen to integrate the Warehouse Management Software into Koning's existing computer system.

The new warehouse was subjected to FIFO (first in, first out) placing and picking analysis. However, there was still a shortage of on-line information.

"We wanted direct control on the store level. Without a wireless data communication system, this seemed impossible," says Hermans.

Hardware integration

Konings sought a warehouse management system that would enable efficient stock management. The company had developed an in-house computer department, for the planning, administration and management of purchasing, manufacturing and sales. A **number** of options were **identified** for physical storage methodology and the use of computer monitoring. The company decided to implement a real-time warehouse stock management system using portable, radio frequency (RF) **barcode** scanning terminals (radio data terminals [RDTs]) to record stock movement. Ten mobile 2280 (LXE, Mechelen, Belgium) terminals were purchased. Moreover, the system was to optimize the use of space and roll the stock using FIFO management.

"The lack of room meant that our forklift truckers placed the incoming **pallets** out of production wherever there was any room left. You can imagine the confusion. As a food industry, we heavily lean on a FIFO delivery scheme. The due date of our products can under no circumstances be exceeded what comes in first, must go out first. And truly speaking, it was a tough job to respect this delivery scheme under these circumstances," says Hermans.

Two mobile operatives at the production plant register the outgoing **pallets** to the storage warehouse. On arrival, their EAN-128 **barcode** labels are scanned again to find a location for them in the warehouse. The information encoded in the labels includes the **pallet number,** type of product, **number** of products and location in the warehouse. They are then stored by forklift truck drivers, equipped with ZT 1280 (LXE) vehicle-mount terminals, and picked for delivery to Belgian customers or collection for Export customers. The wireless warehouse management system monitors the movements and communicates with forklift truck drivers to guide and register their operations.

Konings' new 12000 m2 export warehouse has 10000 random-storage **pallet** places spreading through 11 60-m long aisles, which are lined with 11-m tall high-rise

racks, providing five levels of shelving. The warehouse also has both block and drive-in rack storage of common stock items with LIFO (last in, first out) and FIFO management. The system operates with 6-8 forklift truck drivers operating three shifts in real time, putting away continuous ex-production stock and servicing customer pick up of goods within a two-shift sales despatch operation,
with dispatches averaging 600 **pallets** per week.

System development

After one year of operating the block and drive-in rack-storage system, Census upgraded the system to include random storage of 10000 **pallets** in high-rise racks, with fast selection of high-rise aisles for placement, and a heuristic algorithm for picking to minimize the **number** of aisles that high-rise trucks need to operate in to fulfil single/multiple order picks. This system went live during the first quarter of 1997, with further software development now underway. Census will also develop a home market order-picking operation, which will entail the management of open **pallet** stock, again with strict FIFO picking rules. This new system is scheduled to go live during the second quarter of 1997. It is likely that Census will be contracted to complete all storage control systems for Konings, including the incoming goods to the raw materials stores.

In just 15-18 months, Konings will have undertaken a massive change in logistics management, from manual operation to the latest systems technology, for managing production storage, warehousing logistics and distribution services.

Benefits

The system locates space to put away goods and finds them again when shipping them out. Stocktaking is improved and can be done in situ by blocking a location for counting and confirming stock against its **computerized** location record. Maximum storage capacity can be utilized when tidying wasted space in partially-picked FIFO island locations and from using mixed storage in high-rise racks.

Census Computer Services has been a consultancy, software developer and systems integrator since its formation in 1982. Contact: David Husselbee, Binary House, Boatmans Lane, Walsall WS9 9AG, UK, tel.: 144 1543 454 054, fax: 144 1543 454 008. LXE is a manufacturer of RFDC networks and ADC products for manufacturing, warehousing and material handling operations. Contact: LXE, General de Wittlelann 9-12, B-2800 Mechelen, Belgium, tel. +32 132 15 20 08 08, fax: +32 13215 52 48.

The warehouse system

Census provides real-time **stacker** and put-away placements of incoming **pallets** into island **stacks** and/or levels of drive-in racks, and order picking of full or partial **pallets** for customer collection or multi-customer order-delivery trips.

The warehouse database

Parameterized tables are linked with **barcoded** locations, products and **pallets** to provide a relational database, as follows:

Locations

Each location has a **barcoded number,** a location type, a notional goods-in placement put-away time and a picking despatch area time. Locations may be in use with FIFO, random, despatch and opened products. They may also be marked as "blocked" to prevent their use or access to products in them. An additional form of high-rise rack random storage location is also accommodated, enabling mixed storage of FIFO products.

Fast-search facilities find relevant spaces for put away and locating products when picking.

Products and **pallets** (packsizes)

Products are **identified** using a **barcoded** product **code,** quantity and lot **number.** A product table details random or FIFO usage, quarantine periods, customer-specific labelling and best-before-date considerations. A table also defines mixtures of quantities of packaged goods on each **pallet** type. **Barcodes** are used to **identify** each **pallet** type and its unique **pallet number.**

Storage

User-defined tables detail quantities of **pallets** with their packsizes and location types. All locations have a preferred A,B,C usage classification, so least-used products are stored together and at the furthest distance for put-away and picking.

Managing the workload

Files defining incoming loads are scanned to pre-allocate put-away placements, and files defining customer despatches or delivery trips are scanned to pre-allocate location picking and despatch location placements.

Operation

Stacker-truck drivers log on to put-away or picking operations using directions given on the screens of their RDTs. They are directed to pick **pallets** and take them to locations, for example, from storage to despatch when picking. All **pallets** and locations are scanned and validated, and warnings and audits prevent problems and record activity.

TYPE: Journal; Guideline; Fulltext; Abstract

JOURNAL-CODE: AUTIDNEE

LOAD-DATE: December 1, 1999

LEVEL 1 - 4 OF 237 STORIES

HEADLINE: **Pallet** puzzle: equipment to help optimize warehouse **pallet** operations

BYLINE: Robertson, Robert

BODY:
   The warehouse is no longer a static storage system, but an activity centre
that can have a dramatic impact on the cost of distribution. This was
evident at Logistics '98, held recently in Toronto. As part of the big
show, the folks at Giffels Associates unveiled their Dynamic Warehouse for
attending delegates. It truly was **palletizing** at its best.

   This intriguing supply chain process revealed how logistics managers can
maximize their operations. The integration of materials handling
equipment, bar-coding and software was the key to success for the Dynamic
Warehouse. For those who weren't able to attend this interesting
presentation, here's a quick summary of how it works.

   Using a Caterpillar three-wheel electric lift truck and Trienda Corp.
plastic **pallets,** goods are received on the dock by an operator. These
lightweight **pallets** have four-way entry for handling and storage in any
orientation. The twin-sheet thermoformed, high-density polyethylene **pallet**
exceeds a 3,000-pound rack rating.

   In today's fast-paced distribution environment, accurate and timely
information is critical. Using a Symbol Technology laser-radio terminal to
confirm receipt of the product, **pallets** and boxes received directly from
the vendor are bar-coded. Inventory in the Dynamic Warehouse is controlled
by **Automation** Associates' Stock Locator system.

   Pallets are delivered to the three-deep, high-density storage area by a
Yale NRO35AD model reach truck, which is capable of operating in a narrow
aisle. A 10-foot aisle services the high-density rack, supplied by Concept
Storage Solutions. It consists of **pallet**-flow on the bottom level and
push-back rack above.

   The three-deep, push-back rack features low-profile carts. It also links
carts and lifts out protectors for safety. Below the pushback rack are two
different types of **pallet** flow. One is Logix' 4000 wide-roller system,
which is designed for right-way **pallets** including three stringer skids,

plastic **pallets** or special bins. The other is the Logix 2000 polycarbonate wheel-conveyor system, which handles ''wrong way'' GMA **pallets** without a slave board.

''Note the location bar **codes** on the racking. It's imperative to ensure that the proper product is stored to the correct location,'' says Karl Mitchell, director of logistics for Giffels. ''The bar **code** on the **pallet** and on the rack is scanned by the operator. The location and inventory is immediately updated. In some cases, the portable terminals will suggest a put-away location.''

Swing Time

The Drexel Swingmast truck, distributed by J.H. Thomas Industries, is used to service the very narrow-aisle storage system. The **pallet** is picked up directly on the mailer or receiving dock and taken for putaway in the rack. The truck is available in capacities from 3,000 to 1,200 pounds and lift heights to 30 feet.

A Caterpillar counter-balance unit is then used for putting away **pallets** in the selective rack. **Pallet** racks feature two-inch by 3.25-inch standard duty post and new three-inch by four-inch extra heavy-duty post. Sixteen **pallet** positions come complete with wire-mesh decks, which are used for safety or load handling. Another 16 **pallet** positions have safety bars.

For broken-case picking, product is delivered to the case-flow module by a Yale reach truck. Individual cases are scanned with a hand-held terminal and placed into the case-flow rack, supplied by Pacific Westeel. Carton flow is a simple but effective concept, as it applies inclined shelves that are equipped with roll tract to move goods by gravity.

Cartons will fit neatly side-to-side and top-to-bottom. In a very small physical area, this presents the order picker with a dense amount of SKUs (stock-keeping units) to pick from.

For many warehouses, this results in increased pick rates. Additionally, the operator is rarely faced with a ''stock-out'' situation as sufficient product is stored directly behind the active carton.

The picking operation is broken into four areas -- broken-case picking to tote, full-case picking to conveyor, full-**pallet** picking and low-level case picking. Orders are entered into the order-entry system and downloaded to **Automation** Associates' Stock Locator system. The order to be picked is displayed on portable terminals and confirmed in ''real time.''

For broken-case picking, products are retrieved from the case-flow lane in Sertote returnable containers from the Sertapak Group. The order to be picked is displayed on the portable terminal, and as picking progresses, it's confirmed in real time with the host computer. In essence, you have paperless picking.

Sadler conveyors, featuring tight-radius C-Squares with a 180-degree turn, then get products moving. For full-case picking from the **pallet**-flow lanes, the cases are picked and the host computer validates all processes.

Mistakes are **identified** and corrected immediately by the wireless network. They're then placed directly on the Sadler conveyor for take-away.

The next stage sees products conveyed to a sorter, supplied by Mathews' Swivel Wheel Sorter conveyor, where they're organized into customer orders. This diverter is capable of handling a steady stream of closely spaced product at up to 60 cartons per minute, while directing them to predetermined lines.

Low-level order picking is performed by an Atlet truck, which is also distributed by J.H. Thomas Industries. The truck is used for case-box picking for first and second level. From the push-back rack, full-**pallet** replenishment is done by the Yale reach truck. The front **pallet** is retrieved and the other **pallets** roll forward for next put-away or retrieval.

Pallets are then assembled at the consolidation area. Customer orders are **identified** and sorted onto separate **pallets** for shipping preparation.

The wireless system produces necessary shipping labels, packaging lists and waybills and **identifies** the shipper. To complete this part of the process, the software confirms everything.

Pallets are then delivered to an Orion **automatic** stretch wrapper, distributed by Unisource Canada, using the Caterpillar three-wheel electric lift truck.

The Orion FA55 is standard with a 4,000-pound load-weight capacity, zero to 14 rpm variable-speed turntable drive and a high-performance powered, pre-stretch film delivery system.

''In today's warehouse operation, it's important to select and integrate the best equipment to meet individual business needs,'' says Mitchell. ''We're pleased with our Dynamic Warehouse concept, as it dearly shows how to get the job done.''

Wrap Attack

Mathews Conveyor's WR series of **palletizers** can handle up to 80 cartons per minute. Ranging in weight from three to 150 pounds, the **palletizers** feature a wraparound apron design. The apron completely encircles the **pallet** load-building frame, travelling in one direction around the frame. The load-building chamber, which houses a four-point lift, can accept a 4,000-pound **pallet** load.

Reader Service Card **Number** 215

It Sparkles

Diamond Phoenix Systems' new Powered Conveyor for **pallet** loads is belt-driven to provide uniform power to each roller. The modular construction uses 2.5-inch diameter heavy-duty rollers on centres as dose as three inches. The company's Power Accumulating Conveyor also creates

zero-pressure zones with pneumatic lifters and electronic sensors. As well, two new transfer devices are available.

Reader Service Card **Number** 216

Space Saver

Buckhorn Canada's reusable 48-inch by 45-inch, medium-duty Bulk Box is designed for loads up to 1,800 pounds. The container is ideal for lightweight manufacturing applications such as shipping and handling plastic parts, wiring harnesses, powders and resins. New features include semi-open base and one-centre and four-perimeter plastic runners.

Reader Service Card **Number** 217

Chep Prep

In response to the continued globalization of its major customers, Chep is now offering three **pallets** with a 48-inch by 40-inch footprint (the Chep Canadian Stringer **Pallet,** Chep USA Stringer **Pallet** and Chep Block **Pallet).** Due to the rising demand of display-ready merchandising units in large-scale retail formats, Chep is also introducing its half- and quarter-merchandising **pallets.**

Reader Service Card **Number** 218

Visual Reality

Visual MixPallet allows Moroman robots to **palletize** randomly-presented mixed products. The Windows-based, menu-driven program is one of several in the Motoman Advanced Robot Visual Interface robot-control software family. With the software, users input production **identification numbers,** product dimensions and other data. The Visual MixPallet **automatically** creates **pallet** models.

Reader Service Card **Number** 219

Bulking Up

The Sonobulk System from Greif Containers Inc. is now available with a rugged multi-trip, all-steel **pallet.** With the system, you can **stack** three fully-filled containers. Welded steel cage helps absorb punishment from a lift truck. The containers, which have a capacity of 275 gallons, are reusable and replaceable.

Reader Service Card **Number** 220

Easy Escape

Xytec 4845 collapsible **pallet** containers are constructed of HDPE structural foam. They have access doors on all four sides and include a vented base, removable fork straps and a security lid slotted for a lock or straps. Two standard heights of 25 and 34 inches are available. In addition, the Xytec Highwall system of sidewall extensions allows you to construct containers

up to 66 inches high.

Reader Service Card **Number** 221

Steam Clean

Made from recycled material and totally recyclable, **pallet** solutions from Duraskid are designed for heavy-load capabilities and are water/slip resistant. Rackable to 3,000-plus pounds, the **pallets** are steam cleanable. They can be used for food and retail, beverage manufacturing and warehousing applications. The **pallets** come in 48-inch by 40-inch standard and can be used in extreme conditions.

Reader Service Card **Number** 222

Pallet Strap

Sadler Inc.'s **automated** strapping station consists of a three-strand chain loading/unloading conveyor and twin intermeshing transfers. The lift truck operator places a load on the entry-exit station. The load is **automatically** positioned for each strap, then moves sideways against the strapper to prevent the load from being shifted. It then moves away to travel to the next strap location, as the cycle repeats.

Reader Service Card **Number** 223

Full Nest

Reusable and **stackable** Flap-Nest boxes from IPL Inc. fit standard 48-inch by 40-inch **pallets** and feature:

- Molded plastic hinges that eliminate metal hinge rods, making for easier repair and recycling.

- Box-lid drainage system that protects contents from water damage.

- Convenience of labeling with card holders, large stamping area (ribless exterior) and specially textured top and side areas for simple removal of stick-on labels.

Reader Service Card **Number** 224

Take One

Specialty Equipment Conveyor Company announces the availability of a new catalogue sheet for its heavy-duty Model DTS-3500 **Automatic Pallet** Dispenser. The machine dispenses **pallets** from the bottom of a 20-**pallet** **stack**, at a rate of three **pallets**/minute. Air-operated, retractable dog-type clamps capture the **stack**, while an air-operated lift deposits each **pallet** onto a discharge conveyor.

Reader Service Card **Number** 225

Information on **palletizing** products in this article is available by writing

the following numbers on the reader service card facing page 68:Giftels

Associates	200	
Caterpillar	201	
Trienda		202
Symbol		203
Automation Associates	204	
Yale		205
Concept Storage Solutions		206
Logix	207	
Drexel		
(J.H. Thomas Industries)	208	
Pacific Westeel		209
Sertapak Group		210
Sadler	211	
Mathews		212
Atlet		
(J.H. Thomas Industries)		213
Orion		
(Unisource Canada)	214	

JOURNAL-CODE: 0107

LOAD-DATE: July 01, 1999

LEVEL 1 - 5 OF 237 STORIES

October 23, 1998

HEADLINE: **Pallets** find **automation**

BYLINE: Jonathan Scott

DATELINE: Memphis TN US South Central

BODY:
   After nearly 22 years in the **pallet** business, Michael Doyle now runs what is considered to be one of the most **automated pallet** manufacturing and repair facilities in the nation. So highly **automated** is Doyle's Memphis-based The **Pallet** Factory, Inc., that more than 300 members of the National Wooden **Pallet** & Container Association are scheduled to tour the new plant when the association holds its annual meeting in Memphis next spring. One reason they want to view this facility is take a look at the machines that have allowed The **Pallet** Factory to more than double the **number of pallets** being made and reconditioned at the new plant. "We feel that **automation** has strengthened and helped us," says Doyle. "These **pallets** are a lot better quality and this **automation** has allowed the **number of pallets**-per-man-hour to go way up. Thus, we have been able to maintain our production costs, yet pay our employees more." Other **pallet** manufacturers coming from all around the country want to take a look at the machines driving this revolution in **automation** in the **pallet** industry. Incidentally, the machines were designed by another Memphian, Jim Doyle, of Machine Specialists, Inc., or MSI. Of course, Tim Doyle happens to be Michael's brother. The brothers are fast improving the efficiency of the wooden **pallet** business. It turns out that the **pallet** industry is one that Mike Doyle got into initially by way of the fruit juice business. It all started back in 1977, when Mike bought into a juice franchise known as the Home Juice Co. One day when he was touring a warehouse and distribution center of a juice customer in Jackson, Miss., the business owner mentioned what a problem **pallets** had become to his company. Throughout the warehouse and distribution center, used **pallets were stacking** up at an alarming rate. The business owner told Doyle that about the only solution he had was to pay someone to haul the **pallets** to a dump. Doyle stored away that little bit of information. A short time later, a sales manager for the juice company from Chicago happened to mention how he had sold 40,000 units of juice, but he quickly needed **pallets**. Mike solved both business people's problems by selling the Jackson warehouse operator's **pallets** to the Chicagoan. "And that is how it started," says Mike Doyle, adding that he remained involved in both businesses until 1982 when he sold his share of the juice franchise. Like many successful businesses, The **Pallet** Factory had a humble start. Its first location was in Nonconnah Corporate Center. "We started out with just hammers and nails," recalls Mike. "We had no idea what it would

build into. But we gradually expanded into other plants in Memphis and expanded our territory." In 1987, the company expanded for the first time outside of Memphis when it opened a facility in Lexington, Ky. The move to another state was done primarily to serve one customer: IBM. "IBM had a problem in Lexington where they had a 26-acre facility and needed a lot of **pallets**," says Doyle. "We entered into a deal with them where we would do 30 truckloads of **pallets** a week. That was enough to support a separate facility." Because Nashville is strategically located between Lexington and Memphis, in 1989 the Doyles opened a branch in that city. Others followed: Jackson, Tenn., in 1991; London, Ky., and New Albany, Miss., in 1996. Today, it has six manufacturing plants. In the past 10 years, Doyle notes that the **pallet** industry has undergone some dramatic changes. What was once an industry comprised of numerous mom-and-pop **pallet** producers has gradually experienced some consolidation. In fact, Doyle sold The **Pallet** Factory in 1995. Doyle's company was part of a group of individual **pallet** businesses that decided to consolidate. However, Doyle and one other **pallet** business put their companies in an escrow account. By doing this, Doyle was essentially allowed to retain control of his company if the formed consolidated venture failed to succeed. About a year later, he realized the new venture was not going to work, Doyle withdrew his company from the agreement. It turned out to be a fortuitous move because only Doyle's and the other business in escrow survived. The others all failed. With the increased competition taking place in the **pallet** industry, Doyle says, "We had to regroup and do things better." The **Pallet** Factory began offering its customers a **pallet** management program. The program, which tracks the location and condition of **pallets,** has helped reduce the cost of **pallets** to their clients, he says. The company has also increased its recycling efforts as both an environmentally conscientious and a cost-saving initiative. Doyle was active in the formation of the International Association of **Pallet** Recyclers. But the small business' focus in recent months has been in the area of **automation.** In 1997, Doyle's company bought a parcel of land at 3740 Arnold Road near Shelby Drive and Getwell, where it built a 50,000-square-foot facility and moved in earlier this year. The **Pallet** Factory also owns an adjacent parcel, which it is holding for future expansions, he says. Before he began installing equipment into the new plant, Doyle says he toured more than 200 **pallet** plants around the U.S. "I saw what they were doing good and what was not so good," he says. "I had a good idea of what we wanted to do with our new facility. And, my brother Jim had been in the **pallet** business, and he had started to manufacture **pallet** machines." Working together, the Doyle brothers set up a streamlined **pallet** manufacturing and repair production center. The production facility is laid out so that **pallets** are quickly separated into **stacks** of re-usable **pallets, pallets** that need to be repaired and **pallets** that need to be trashed. **Pallets** are also sorted and divided into **stacks** of the two primary types: block- and stringer-designed. Machines separate and **stack** the various **pallets.** They are unloaded and moved along an assembly line that singles out **pallet** that have a damaged board. The broken boards are removed, the nails hammered flat and new boards attached to the **pallet** -- all with little labor. Before installing the new equipment, Doyle says The **Pallet** Factory handled between 3,500-4,000 **pallets** a day. In the new **automated** facility, the company averages 9.000 **pallets** per day. More than 40 people work in the Memphis production facility; the business employs some 180 company-wide, he says. The **Pallet** Factory is gradually installing some of the new equipment at its other plant locations, says Doyle. At the moment, however, few **pallet** facilities can rival the company's Memphis operation.

GRAPHIC: Photo

Memphis Business Journal, October 23, 1998